# Altos R700 Series

## User's guide

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Altos R700 Server Board
User's guide

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Purchase Date: _____________________________________

Place of Purchase: __________________________________

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# Notices

## FCC notice

Class A devices do not have an FCC logo or FCC IDE on the label. Class B devices have an FCC logo or FCC IDE on the label. Once the class of the device is determined, refer to the following corresponding statement.

### Class A equipment

This device has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

### Class B equipment

This device has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This device generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this device does cause harmful interference to radio or television reception, which can be determined by turning the device off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the device and receiver
- Connect the device into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/television technician for help

## Notice:  Shield cables

All connections to other computing devices must be made using shielded cables to maintain compliance with FCC regulations.

## Notice:  Peripheral devices

Only peripherals (input/output devices, terminals, printers, etc.) certified to comply with the Class A or Class B limits may be attached to this equipment. Operation with noncertified peripherals is likely to result in interference to radio and TV reception.

**Caution!**  Changes or modifications not expressly approved by the manufacturer could void the user's authority, which is granted by the Federal Communications Commission, to operate this server.

## Use conditions

This part complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## Notice:  Canadian users

This Class A/Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

# Important safety instructions

Read these instructions carefully. Save these instructions for future reference.

1. Follow all warnings and instructions marked on the product.
2. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
3. Do not use this product near water.
4. Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
5. Slots and openings on the back or bottom side of the chassis are provided for ventilation; to ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register, or in a built-in installation unless proper ventilation is provided.
6. This product should be operated from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
7. Do not allow anything to rest on the power cord. Do not locate this product where persons will walk on the cord.
8. If an extension cord is used with this product, make sure that the total ampere rating of the equipment plugged into the extension cord does not exceed the extension cord ampere rating. Also, make sure that the total rating of all products plugged into the wall outlet does not exceed the fuse rating.
9. Never push objects of any kind into this product through chassis slots as they may touch dangerous voltage points or short out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.
10. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage points or other risks. Refer all servicing to qualified service personnel.
11. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
    - a When the power cord or plug is damaged or frayed
    - b If liquid has been spilled into the product
    - c If the product has been exposed to rain or water

d If the product does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal condition.

e If the product has been dropped or the cabinet has been damaged

f If the product exhibits a distinct change in performance, indicating a need for service.

12 Replace the battery with the same type as the product's battery we recommend. Use of another battery may present a risk of fire or explosion. Refer battery replacement to a qualified service technician.

13 **Warning!** Batteries may explode if not handled properly. Do not disassemble or dispose of them in fire. Keep them away from children and dispose of used batteries promptly.

14 Use only the proper type of power supply cord set (provided in your accessories box) for this unit. It should be a detachable type: UL listed/CSA certified, type SPT-2, rated 7A 125V minimum, VDE approved or its equivalent. Maximum length is 15 feet (4.6 meters).

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# 1 Description

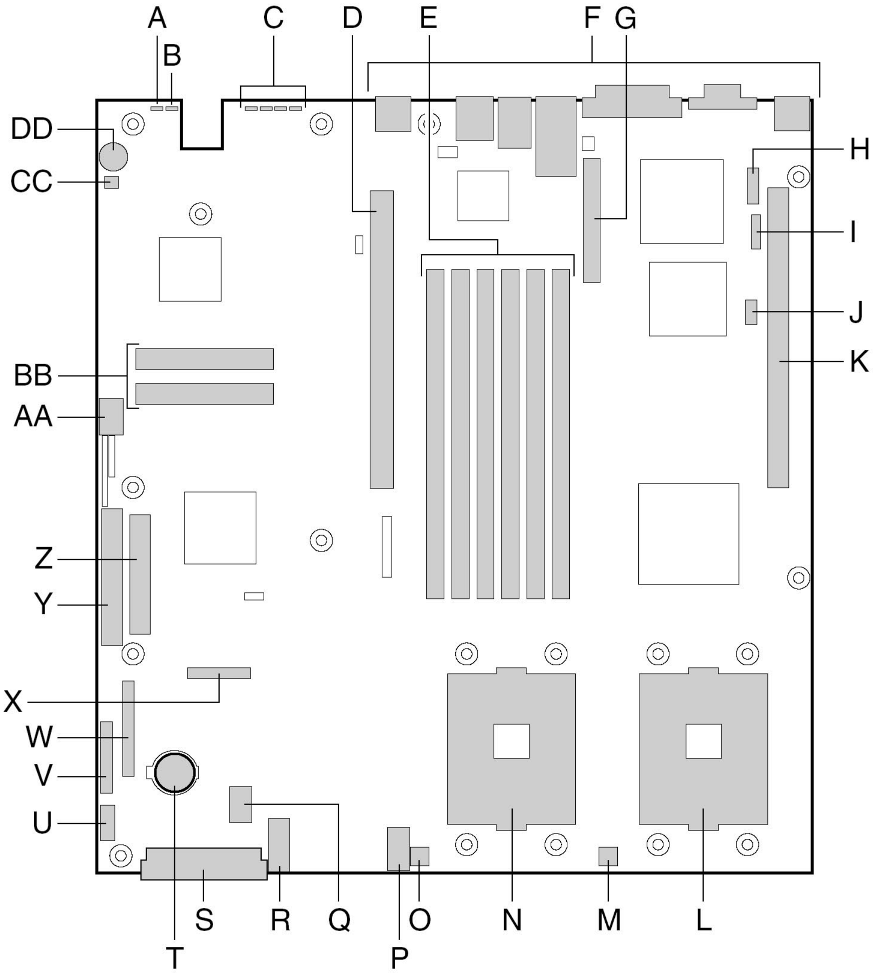
# Server Board Features

Table 1 Server Board Features

| Feature | Description |
|---|---|
| Processors | Dual processor slots supporting Intel® Xeon™ processors in an INT3/FCPGA Socket 604 package. |
| Memory | Six dual inline memory module (DIMM) slots support:<br>• DDR-200 or DDR-266 compliant, ECC, registered, 72-bit, 168-pin, DIMMs<br>• From 256MB to 12 GB of memory |
| Graphics | Integrated onboard ATI RAGE† XL PCI SVGA controller. |
| Video Memory | 8 MB SDRAM of video memory. |
| PCI bus | Two PCI riser slots capable of supporting either of the following configurations:<br>• 1U configuration-one full-length, full-height 64-bit PCI riser slot and one Low Profile (LP) 64-bit PCI riser slot.<br>• 2U configuration-three full-length, full-height 64-bit PCI riser slots and three LP 64-bit PCI riser slots. |
| Network | Dual on-board 10/100/1000 Network Interface Controllers (NIC). |
| System I/O (see Table 1) | One PS/2† keyboard/mouse port (6 pin DIN).<br>One VGA video port (15 pin).<br>Two external USB ports, internal header providing two additional USB.<br>One external serial port (RJ-45), one internal COM 1 header.<br>One external SCSI port (SCSI server board only), one internal.<br>Two NIC ports (RJ-45). |
| Form Factor | Server ATX form factor. |

# Server Board Connector and Component Locations

The Altos R700 Server Board comes only in SCSI version. Figure 1 is a view of SCSI versions.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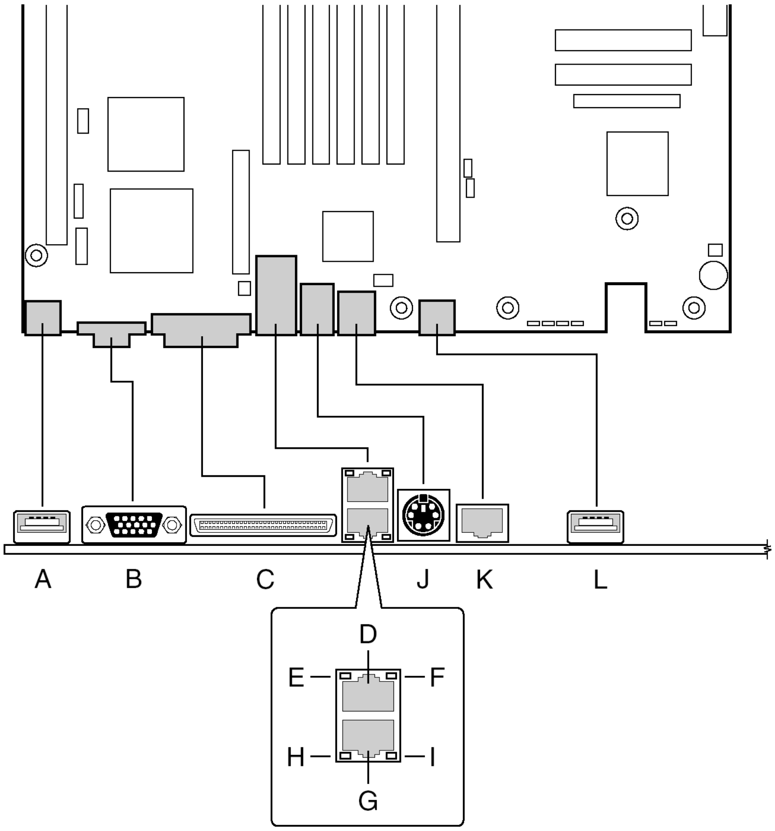
| Label | Description |
|---|---|
| A | System status LED |
| B | ID LED |
| C | Diagnostic LEDs (POST code) |

| Label | Description |
|---|---|
| D | 64-bit PCI riser slot for PCI-X bus B (full height) |
| E | DIMM slots |
| F | I/O ports |
| G | SCSI channel B connector (SCSI version only) |
| H | COM 1 serial header |
| I | ICMB connector |
| J | IPMB connector |
| K | 64-bit PCI riser slot for PCI-X bus C (low profile) |
| L | Secondary processor socket |
| M | Secondary processor fan connector |
| N | Primary processor socket |
| O | Primary processor fan connector |
| P | Auxiliary signal connector |
| Q | Sys fan 1 connector |
| R | Sys fan 2 connector |
| S | Main power connector |
| T | Battery |
| U | Power supply signal connector |
| V | ATX front panel connector |
| W | SSI front panel connector |
| X | Floppy/FP/IDE connector |
| Y | ATA/IDE connector |
| Z | Floppy drive connector |

| Label | Description |
|---|---|
| AA | USB 2 & 3 header |
| BB | ATA-100 connectors (ATA version only) |
| CC | Hard Disk Drive LED header |
| DD | Speaker |

# Back Panel Connectors



| Label | Description |
|---|---|
| A | USB 0 connector |
| B | Video connector |

| **Label** | **Description** |
|---|---|
| C | SCSI channel A connector (SCSI server board only) |
| D | NIC 2 RJ-45 connector |
| E | Status LED |
| F | Speed LED |
| G | NIC 1 RJ-45 connector |
| H | Status LED |
| I | Speed LED |
| J | PS/2 keyboard/mouse connector |
| K | RJ-45 serial port |
| L | USB 1 connector |

# Processor

The Altos R700 server board accommodates one or two Intel Xeon processors with 512k cache in the INT3/FCPGA Socket 604 package. This processor uses the .13 micron technology.

# Memory

The system board has six 168-pin DIMM slots each supporting 72-bit ECC registered DDR DIMMs (DDR-200 or DDR-266 compatible). Memory is partitioned in three banks. You may install a minimum of 256 MB (128MB x 2) and as much as 12 GB. Memory must be installed in pairs, starting with bank 1 (slots 1B and 1A).

The controller automatically detects, sizes, and initializes the memory array, depending on the type, size, and speed of the installed DIMMs, and reports memory size and allocation to the server via configuration registers.

**Note**: Use DIMMs that have been tested for compatibility with the server board. Contact your sales representative or dealer for a current list of approved memory modules.

# PCI Riser Slots

The server board has two PCI riser slots. Riser slot B provides the following features:

- 184 pin, 5 volt keyed, 64-bit expansion slot connector
- Support for either a 1-slot or a 3-slot PCI riser card
- Support for both full length and low profile PCI cards

Riser C provides the following features:

- 184 pin, 5 volt keyed, 64-bit expansion slot connector
- Support for either a 1-slot or a 3-slot PCI riser card
- Support for only low profile PCI cards

# Video

The Altos R700 Server Board uses an ATI RAGE XL PCI graphics accelerator with 8 MB of video SDRAM.

The embedded SVGA video subsystem supports:

- Resolutions up to 1600 x 1200 under 2D and 1024 x 768 under 3D
- CRT and LCD monitors up to 100 Hz vertical refresh rate

The server board supports disabling of the onboard video through the BIOS setup menu or when a plug in video card is installed in any of the PCI slots.

# SCSI Controller

The SCSI version of the server board includes an embedded Adaptec AIC-7899W / 7902W controller providing dual Ultra160/Ultra 320* Low Voltage Differential (LVD) SCSI channels.

The SCSI bus is terminated on the server board with active terminators that cannot be disabled. The onboard device must always be at one end of the bus. The device at the other end of the cable must also be terminated. LVD devices generally do not have termination built-in and need to have a termination source provided. Non-LVDs devices generally are terminated through a jumper or resistor pack on the device itself..

Note: Ultra 320 only for AIC-7902W

# Network Controller

**Note**: To ensure EMC product regulation compliance, the system must be used with a shielded LAN cable.

The server board uses the Intel® 82546EB Fast Ethernet Controller and supports two 10Base-T/1000Base-TX network subsystems.

The 82546EB controller supports the following features:

- 32-bit PCI master interface
- Integrated IEEE 802.3 10Base-T, 100Base-TX and 1000Base-TX compatible PHY†
- IEEE 820.3u auto-negotiation support
- Full duplex support at 10 Mbps, 100 Mbps, and 1000 Mbps operation
- Low power +3.3 V device

On the Altos R700 Server Board, NIC 1 can be used as both a network interface and server management interface.

## NIC Connector and Status LEDs

The 82546 controller drives LEDs on the network interface connector that indicate link/activity on the LAN and speed of operation. The green LED indicates network connection when on and TX/RX activity when blinking. The speed LED indicates 1000 Mbps when amber, 100 Mbps when green, and 10 Mbps when off.

# System Cooling

The chassis includes four 60-mm non-hot-swappable system fans for cooling the processor(s), hard drives, and add-in cards. The system fans are mounted in a fan module located in the middle of the chassis to pull cooling air through the chassis. The power supply contains a single fan for cooling.

Note: The noise emission is under 70 dB.

# Keyboard and Mouse

The keyboard/mouse controller is PS/2-compatible. If specified through the System Setup Utility (SSU), the server may be locked automatically if there is no keyboard or mouse activity for a predefined length of time. Once the inactivity (lockout) timer has expired, the keyboard and mouse do not respond until the previously stored password is entered. A Y-cable can be used if both a PS/2 mouse and keyboard are required at the same time.

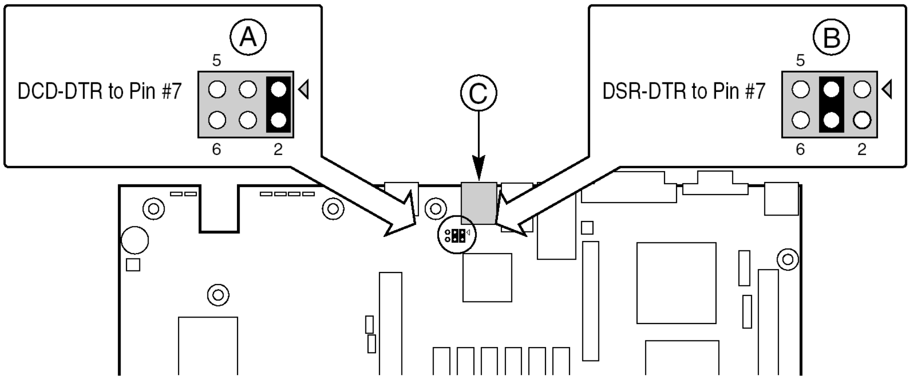
# RJ-45 Serial Port

The rear RJ-45 serial port is a fully functional serial port that supports any standard serial device and provides support for serial concentrators. For server applications that use a serial concentrator to access the server management features of the baseboard, a standard 8-pin CAT-5 cable from the serial concentrator is plugged directly into the rear RJ-45 serial port. The 8 pins of the RJ-45 connector can be configured to match either of two pin-out standards used by serial port devices. To accommodate either standard, the J5A2 jumper block located directly behind the rear RJ-45 serial port must be jumpered appropriately according to the desired standard.

**Note**: By default, the RJ-45 serial port is configured to support a DSR signal.

For serial devices that require a DSR signal (default), the J5A2 jumper must be configured in position 3-4 (See figure below, B).

For serial devices that require a DCD signal, the jumper must be in position 1-2 (See figure below, A).



For server applications that require a DB9 serial connector, you must use an 8-pin RJ-45-to-DB9 adapter. The following table defines the pin-out required for the adapters to provide RS232 support.

| RJ-45 | Signal | Abbreviation | DB9 |
|---|---|---|---|
| 1 | Request to Send | RTS | 7 |

| RJ-45 | Signal | Abbreviation | DB9 |
|---|---|---|---|
| 2 | Data Terminal Ready | DTR | 4 |
| 3 | Transmitted Data | TD | 3 |
| 4 | Signal Ground | SGND | 5 |
| 5 | Ring Indicator | RI | 9 |
| 6 | Received Data | RD | 2 |
| 7 | DCD or DSR | DCD/DSR | 1 or 6 |
| 8 | Clear to Send | CTS | 8 |

# ACPI

The Altos R700 server board supports the Advanced Configuration and Power Interface (ACPI) as defined by the ACPI 2.0 specification. An ACPI aware operating system can put the system into a state where the hard drives spin down, the system fans stop, and all processing is halted. However, the power supply will still be on and the processors will still be dissipating some power, so the power supply fans will still run.

The Altos R700 server board supports sleep states s0, s1, s4, and s5:

- s0: Normal running state.
- s1: Processor sleep state. No context will be lost in this state and the processor caches will maintain coherency.
- s4: Hibernate or Save to Disk: The memory and machine state are saved to disk. Pressing the power button or other wakeup event will restore the system state from the disk and resume normal operation. This assumes that no hardware changes have been made to the system while it was off.
- s5: Soft off: Only the RTC section of the CSB and the BMC are running in this state. No context is saved by the OS or hardware.

**Caution**: The system is off only when the AC power cord is disconnected.

# System Management

ASMe integrates system management features into the hardware and provides additional features through ASMe Server Management software. This section describes the integrated hardware features, Acer Advance Server Management software, and the System Setup Utility and FRU/SDR Load Utility used to configure the hardware features.

## Baseboard Management Controller

Acer server boards incorporate a baseboard management controller (BMC), which is a dedicated microcontroller for system management activities. The BMC performs the following functions:

- Monitors system components and sensors, including processors, memory, fans, power supplies, temperature sensors, and chassis intrusion sensors.
- Manages nonvolatile storage for the system event log (SEL), sensor data records (SDRs), and baseboard field-replaceable unit (FRU) inventory.
- Interfaces with the emergency management port (EMP) and LAN1 port to send alerts and interact with remote management systems.
- Provides the main front panel control functions (power on/off, reset, and so on).

## Field Replaceable Units and Sensor Data Records

Field replaceable units (FRUs) are major modules in the chassis that contain active electronic circuitry. FRUs can store information-such as board serial number, part number, name, and asset tag-that can be read using the System Setup Utility (see “Viewing FRU Information” on page 64). The BMC stores FRU information for the baseboard in a nonvolatile storage component on the board.

The BMC uses Sensor Data Records (SDRs) to identify the sensors in the system for monitoring. SDRs provide a list of the sensors, their characteristics, location, type, and type-specific information, such as default threshold values, factors for converting a sensor reading into the appropriate units (mV, rpm, degrees Celsius), and information on the types of events that a sensor can generate. The BMC stores SDR information in a nonvolatile storage component on the baseboard.

You can use the FRU/SDR Load Utility (see “FRU/SDR Load Utility Description” on page 76) to initialize or update the FRU and SDR information. Acer server boards are shipped from the factory with some sensors disabled, because the actual configuration of the chassis is only determined when the user completes the system configuration. Chassis-specific information in the FRU, such as chassis part number, is also absent. For these reasons, it is important to run the FRU/SDR Load Utility as part of the system setup process. You should also run the FRU/SDR Load Utility whenever you change the number of fans, processors, or power supplies in the server.

## System Event Log

The BMC manages a system event log (SEL), where it records significant or critical system events. Such events include temperatures and events. The BIOS, software, and other devices can also log events by sending messages to the BMC. The SEL is stored in nonvolatile storage.

You can view the current contents of the SEL by using the System Setup Utility (see “Viewing the System Event Log” on page 63).

## Platform Event Management

Events can trigger alerts and other actions by the BMC. The server is configured with the following set of standard events:

- Temperature sensor out of range
- Voltage sensor out of range
- Fan failure
- Chassis intrusion
- Power supply fault
- BIOS uncorrectable ECC error
- BIOS POST error
- Processor fault resilient booting (FRB) failure
- Fatal nonmaskable interrupt (NMI) from a source other than the front panel switch
- Watchdog timer reset, power down, or power cycle
- System restart (reboot)

Alerts can take either of these forms:

- **Platform event pages** -- the BMC dials a paging service and sends a predefined paging string. To use platform event paging (PEP), you must attach an external modem to the emergency management port (Serial 2).
- **BMC LAN alerts** -- the BMC sends an alert to a predefined destination on the LAN.

You can configure PEP and BMC LAN alerts by using the System Setup Utility (see “Alerting for Platform Events” on page 68).

## Emergency Management Port

The emergency management port (EMP) refers to the use of the Serial 2 port, with either an external modem or direct serial connection, for remote management. The BMC controls the port and interfaces with remote access software, such as the Direct Platform Control application in Acer Advance Server Management.

You can configure the EMP by using the System Setup Utility (SSU) or the System Configuration Wizard (SCW).

### EMP and Serial Over LAN

The RJ-45 Serial 2 port on the back panel can be configured in several different ways: as a standard serial port, as an Emergency Management Port, or for serial output redirection over a LAN. You can configure these settings using either the SSU or the SCW.

**Note**:

**Important Altos R700 Server Chassis considerations**: If you have configured the Serial 2 port for use as an Emergency Management Port and “always available”, the Serial 2 port will be accessible only by remote server management software. The operating system will never be able to access the port.

If you have configured the Serial 2 port for Serial Over LAN, the port’s functionality will only be impacted when there is an active Serial Over LAN session from a remote console. At all other times either the operating system or EMP will control the port, depending on your configuration.

# Acer Advance Server Management (ASMe)

Acer Advance Server Management (ASMe) is a system management package that is included on the ASMe CD. ASMe applications interact with the integrated hardware system management features of the server to allow you to monitor and manage a server from a remote workstation:

- Remote connection from a Windows-based client workstation over a LAN, or over a modem or direct serial connection to the emergency management port on the server.
- Real-time monitoring and alerting for server hardware sensors.
- Emergency management when the server is off (but still connected to AC power) lets you verify the state of the server, diagnose hardware problems, and power on/off or reset the server.
- Run the System Setup Utility to change the server configuration.

ASMe can use an optional service partition on the server that you are managing. The service partition is a special disk partition on the system drive that contains a ROM-DOS operating system and DOS-based utilities, including the System Setup Utility, FRU/SDR Load Utility, and Remote Diagnostics. The server can be booted to the service partition, either locally or remotely, to provide access to the utilities.

For more information on Acer Advance Server Management and the individual ASMe applications, see the ASMe CD.

# Security

## Intrusion Switch Monitoring

To help prevent unauthorized entry or use of the server, Acer Advance Server Management server management software monitors the chassis intrusion switch if one is installed. Opening an access cover will transmit an alarm signal to the server board, where BMC firmware and server management software process the signal. The system can be configured through ASMe to respond to an intrusion a number of ways, including powering down or locking the keyboard.

## Software Locks

The BIOS Setup and the System Setup Utility (SSU) provide a number of security features to prevent unauthorized or accidental access to the system. Once the security measures are enabled, you can access the system only after you enter the correct password(s). For example:

- Enable the keyboard lockout timer so that the server requires a password to reactivate the keyboard and mouse after a specified time out period¾1 to 120 minutes.
- Set and enable a supervisor password.
- Set and enable a user password.
- Set secure mode to prevent keyboard or mouse input and to prevent use of the front panel reset and power switches.
- Activate a hot key combination to enter secure mode quickly.
- Disable writing to the diskette drive when secure mode is set.
- Disable access to the boot sector of the operating system hard disk drive.

## Using Passwords

You can set either the user password, the supervisor password, or both passwords. If only the user password is set, you:

- Must enter the user password to enter BIOS Setup or the SSU.
- Must enter the user password to boot the server if Password on Boot is enabled in either the BIOS Setup or SSU.

- Must enter the user password to exit secure mode.

If only the supervisor password is set, you:

- Must enter the supervisor password to enter BIOS Setup or the SSU.
- Must enter the supervisor password to boot the server if Password on Boot is enabled in either the BIOS Setup or SSU.
- Must enter the supervisor password to exit secure mode.

If both passwords are set, you:

- May enter the user password to enter BIOS Setup or the SSU. However, you will not be able to change many of the options.
- Must enter the supervisor password if you want to enter BIOS Setup or the SSU and have access to all of the options.
- May enter either password to boot the server if Password on Boot is enabled in either the BIOS Setup or SSU.
- May enter either password to exit secure mode.

## Secure Mode

Configure and enable the secure boot mode by using the SSU. When secure mode is in effect:

- You can boot the server and the operating system will run, but you must enter the user password to use the keyboard or mouse.
- You cannot turn off system power or reset the server from the front panel switches.

Secure mode has no effect on functions enabled via remote server management or power control via the watchdog timer.

Taking the server out of secure mode does not change the state of system power. That is, if you press and release the power switch while secure mode is in effect, the system will not be powered off when secure mode is later removed. However, if the front panel power switch remains depressed when secure mode is removed, the server will be powered off.

# Summary of Software Security Features

The table below lists the software security features and describes what protection each offers. In general, to enable or set the features listed here, you must run the SSU and go to the Security Subsystem Group, menu. The table also refers to other SSU menus and to the Setup utility.

| **Feature** | **Description** |
|---|---|
| Secure Mode | How to enter secure mode:<br>• Setting and enabling passwords automatically places the system in secure mode.<br>• If you set a hot-key combination (through Setup), you can secure the system simply by pressing the key combination. This means you do not have to wait for the inactivity time-out period.<br>When the system is in secure mode:<br>• The server can boot and run the operating system, but mouse and keyboard input is not accepted until the user password is entered.<br>• At boot time, if a CD is detected in the CD-ROM drive or a diskette in drive A, the system prompts for a password. When the password is entered, the server boots from CD or diskette and disables the secure mode.<br>• If there is no CD in the CD-ROM drive or diskette in drive A, the server boots from drive C and automatically goes into secure mode. All enabled secure mode features go into effect at boot time.<br>To leave secure mode: Enter the correct password(s). |
| Disable writing to diskette | In secure mode, the server will not boot from or write to a diskette unless a password is entered.<br>To write protect access to diskette whether the server is in secure mode or not, use the Setup main menu, Floppy Options, and specify Floppy Access as read only. |

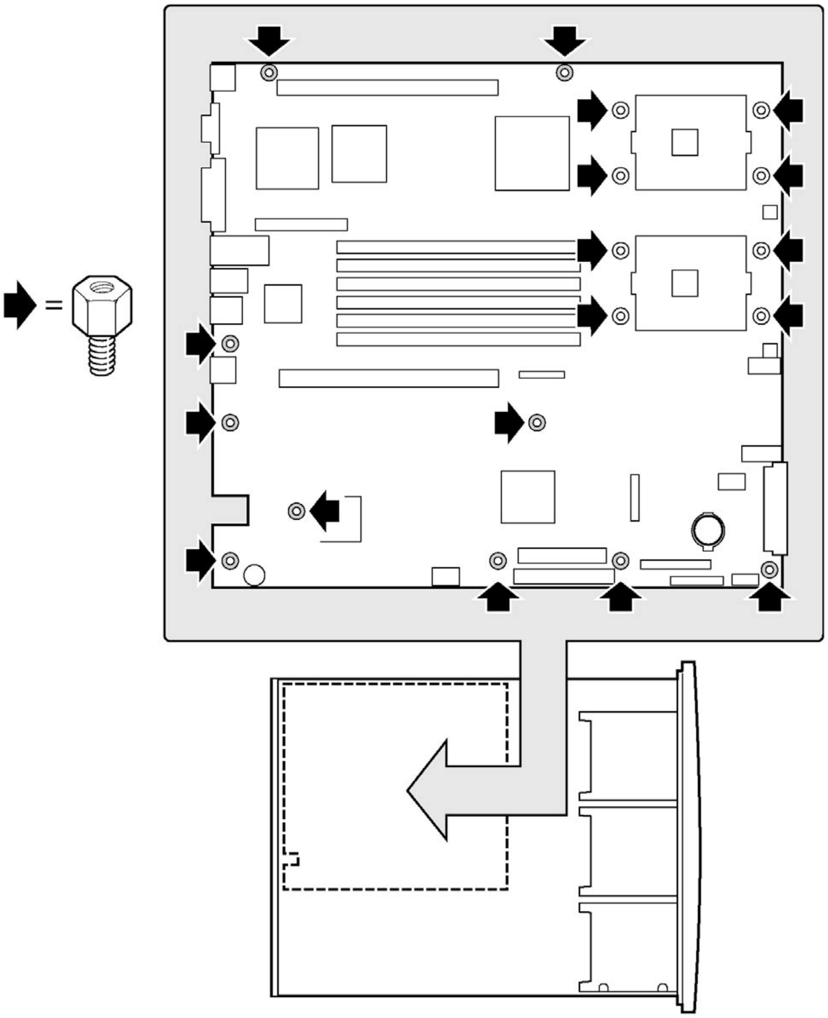
| **Feature** | **Description** |
|---|---|
| Set a time out period so that keyboard and mouse input are not accepted<br>Also, screen can be blanked, and writes to diskette can be inhibited | Specify and enable an inactivity time out period of from 1 to 120 minutes.<br>If no keyboard or mouse action occurs for the specified period, attempted keyboard and mouse input will not be accepted.<br>The monitor display will go blank, and the diskette drive will be write protected (if these security features are enabled through Setup).<br>To resume activity: Enter the correct password(s). |
| Control access to using the SSU: set supervisor password | To control access to setting or changing the system configuration, set a supervisor password and enable it through Setup.<br>If both the supervisor and user passwords are enabled, either can be used to boot the server or enable the keyboard and/or mouse, but only the supervisor password will allow Setup to be changed.<br>To disable a password, change it to a blank entry or press CTRL-D in the Change Password menu of the Supervisor Password Option menu found in the Security Subsystem Group.<br>To clear the password if you cannot access Setup, change the Clear Password jumper (see “6 Technical Reference” on page 95). |
| Control access to the system other than SSU: set user password | To control access to using the system, set a user password and enable it through Setup.<br>To disable a password, change it to a blank entry or press CTRL-D in the Change Password menu of the User Password Option menu found in the Security Subsystem Group.<br>To clear the password if you cannot access Setup, change the Clear Password jumper (see “6 Technical Reference” on page 95). |
| Boot without keyboard | The system can boot with or without a keyboard. During POST, before the system completes the boot sequence, the BIOS automatically detects and tests the keyboard if it is present and displays a message. |

| Feature | Description |
|---|---|
| Specify the boot sequence | The sequence that you specify in setup will determine the boot order. If secure mode is enabled (a user password is set), then you will be prompted for a password before the server fully boots. If secure mode is enabled and the "Secure Boot Mode" option is also enabled, the server will fully boot but will require a password before accepting any keyboard or mouse input. |

# 2 Installation Procedures

# Rearrange the Standoffs

If your chassis does not have board mount standoffs placed as shown, you must rearrange them so they match the holes in the server board. Failure to properly rearrange the metal standoffs may cause the server board to malfunction and may permanently damage it. Your chassis may be different from the illustration.



# Install the Server Board

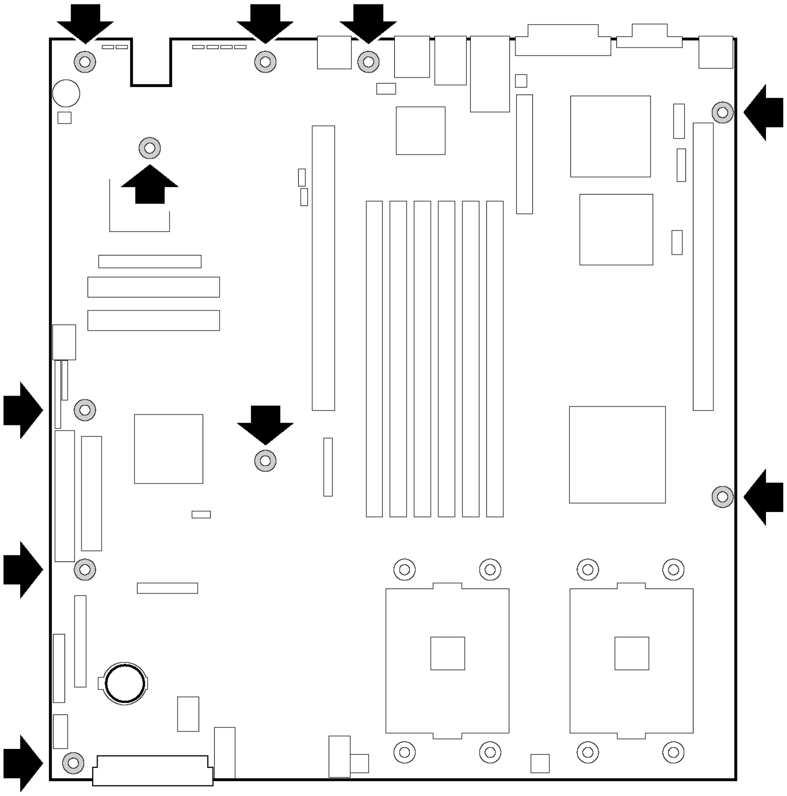
To ensure proper grounding and support, it is recommended that you install screws in all the required mounting holes for your chassis. You may need to move cables out of the way to properly install your server board.

1 While placing the board on the chassis standoffs, carefully position the board I/O connectors into the rear chassis I/O openings.

2 Adjust board position to align mounting holes with standoffs.

3 Using the screws that came with your chassis, mount the board to the chassis.

**Note**: If you install the server board into an Altos R700 chassis, you will not use all of the mounting holes. See your chassis documentation for more details.

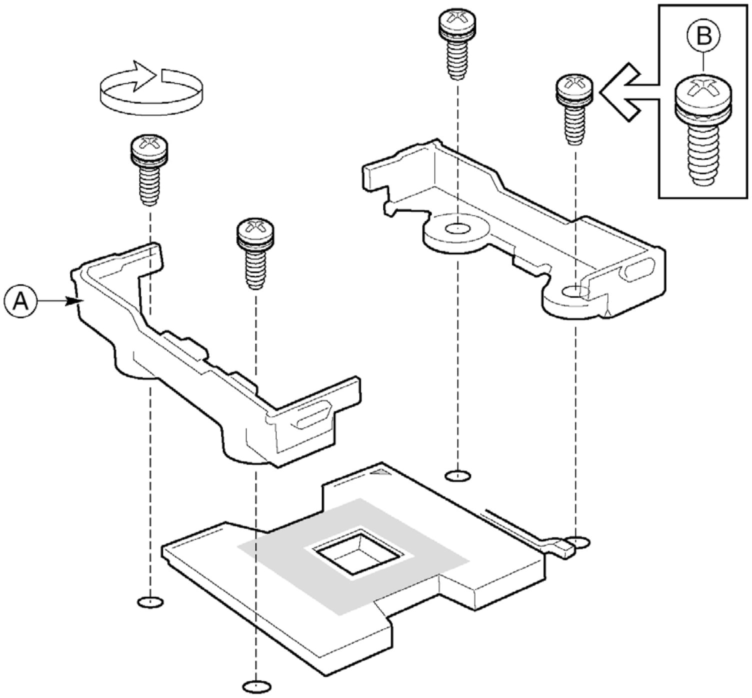


# Install the Processor Retention Brackets

There are four brackets, two for each processor socket. For each bracket, do the following:

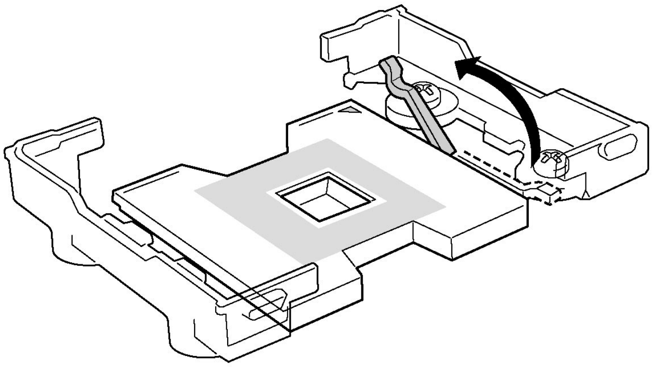
1 Place the bracket (A) on the server board.

2 Insert and tighten two screws (B) to secure the bracket.

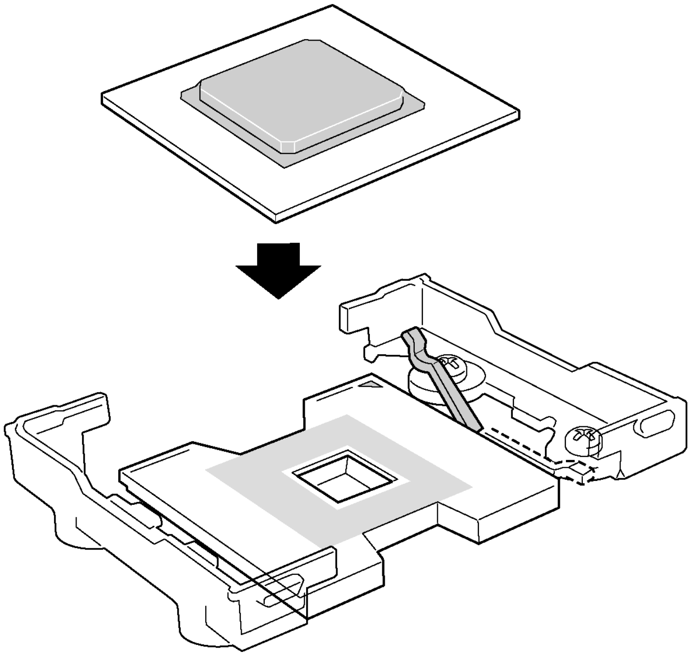


# Installing Processors

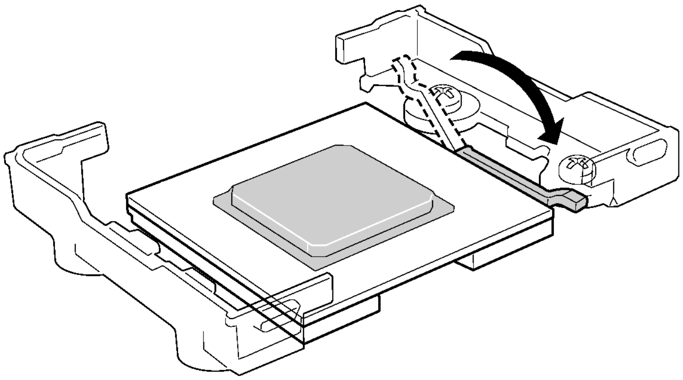
1 Raise the locking bar on the socket.



2 Aligning the pins of the processor with the socket, insert the processor into the socket.



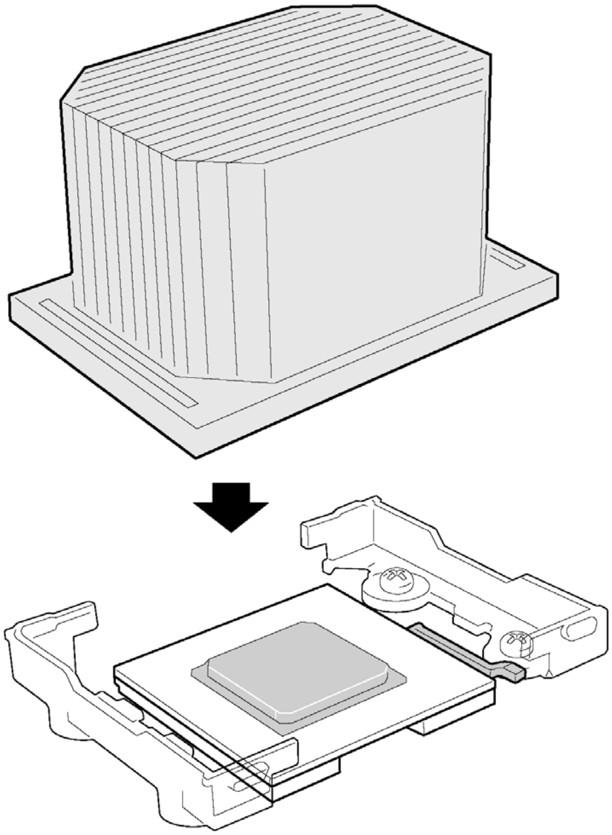
3 Lower the locking bar completely.



4 Follow the instructions packaged with your boxed processor for preparing the heat sink and processor for installation.

5 Position the heat sink above the processor.

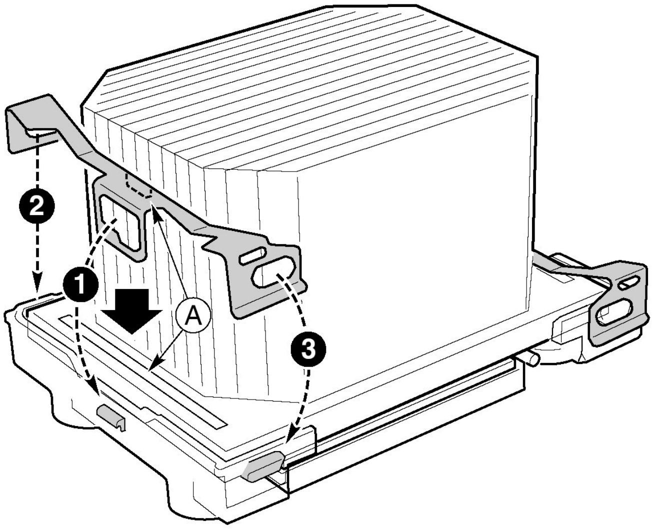
6 Aligning the raised metal surfaces, place the heat sink on top of the processor.



7 Place the heat sink clip (1) so the tab on the clip engages the slot on the heat sink (A).

8 Press one end of the clip down (2).

9 Press the other end of the clip down (3).

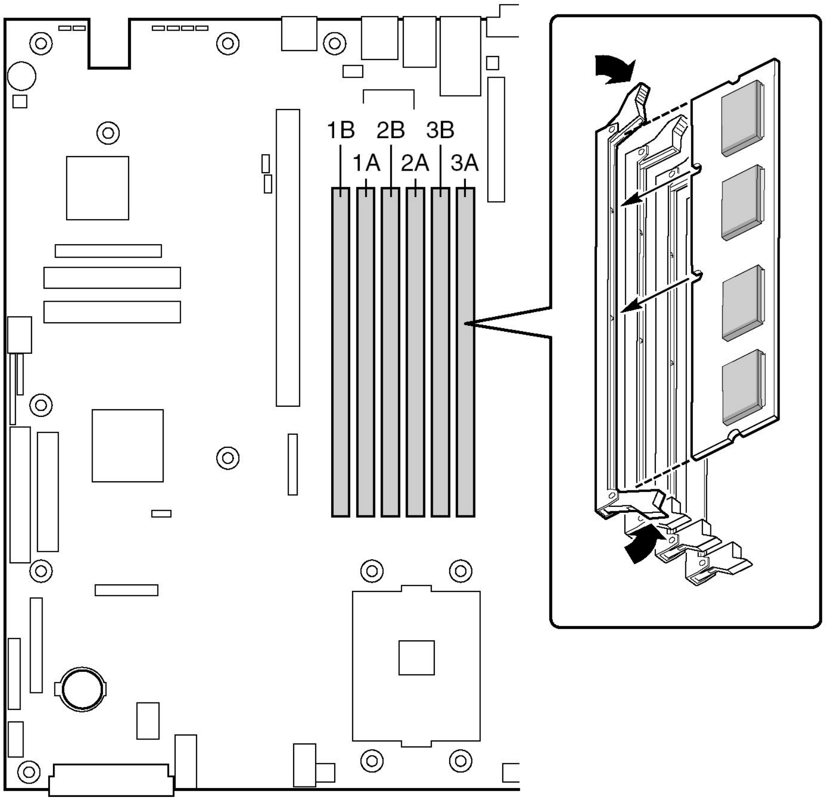


# Memory

Only DDR-200 or DDR-266 compliant SDRAM is supported by the server board. Install from 256 MB to 12 GB of registered, ECC memory, using up to six DIMMs. A 1U chassis requires lowprofile (LP) 1.2-inch DIMMs.

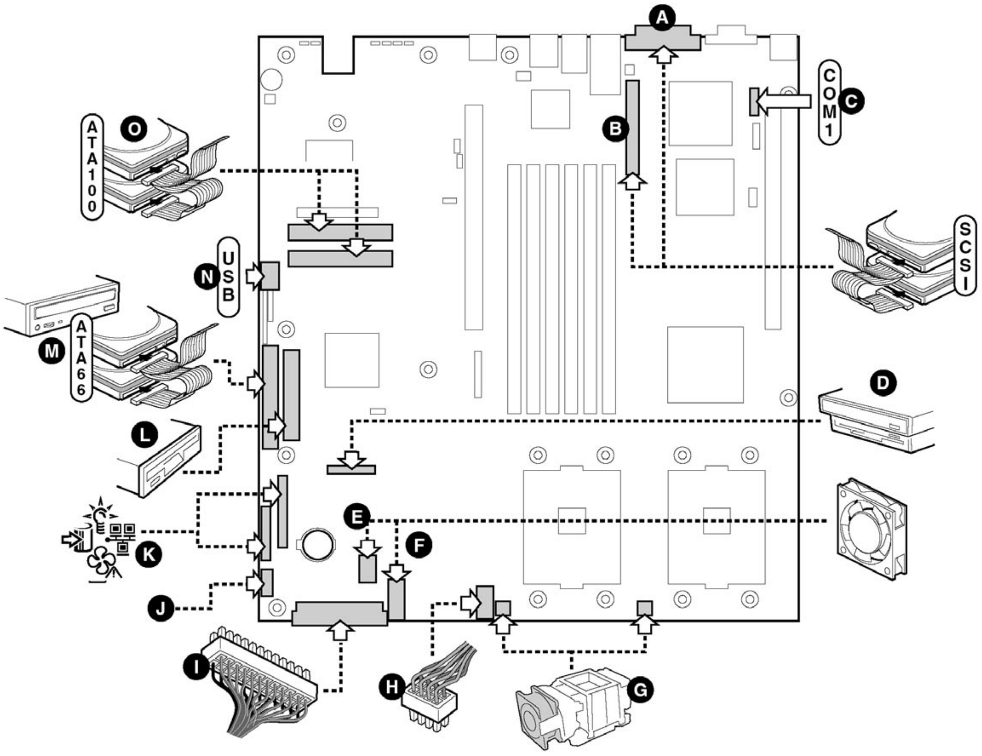
DIMMs must be installed in pairs and in the following order: 1B and 1A, 2B and 2A, 3B and 3A.

Installed DIMMs must be the same speed and must all be registered.



# Connect Cables

Before connecting cables, consult the documentation supplied with your chassis.



| Label | Description |
|---|---|
| A | External SCSI channel A connector (SCSI server board only) |
| B | Internal SCSI channel B connector (SCSI server board only) |
| C | Serial 1 header |
| D | Combined Floppy/Front Panel/IDE connector (For use in an Altos chassis only) |
| E | Fan module connector |
| F | Fan module connector |
| G | Processor fan connectors (For use in a non Altos chassis only) |
| H | Auxiliary power connector |

| Label | Description |
|---|---|
| I | Main power connector |
| J | Power supply signal connector |
| K | Front panel connector (For use in a non Altos chassis only) |
| L | Floppy connector (For use in a non Altos chassis only) |
| M | IDE connector (For use in a non Altos chassis only) |
| N | USB header |
| O | ATA-100 primary/secondary connectors (ATA server board only) |

## Installing a Service Partition on the Server (Optional)

The Service Partition provides advanced remote management and configuration functionality. Installing it on a server is optional.

1. Power-on the server, insert the Acer Advance Server Management CD into the CD-ROM drive, and boot to the CD.
2. Select **Utilities** > **Run Service Partition Administrator** > **Create Service Partition-first time**.
3. Select an available hard drive. The server will reboot to the CD.
4. Select **Format Service Partition and Install Software**.
5. Exit the menu. Remove the CD and reboot to install the server operating system. After installing the operating system, proceed to Acer Advance Server Management Installation.

## Installing your Operating System

Install your operating system now.

## Installing Acer Advance Server Management

You can install Acer Advance Server Management on a local server or on a remote workstation that is used to manage a LAN/WAN.

1. Insert the Acer Advance Server Management CD into the system's CD-ROM.
2. Click **Install Server Management**.
3. Select the applicable system option.
4. Review the Acer Software License Agreement and click Accept.
5. If installing to a local server, click Install Now. If this is a multiple system installation, click Add to compile a list of systems and then click Install Now.
6. Select **Reboot Now** or **Reboot Later**.
7. Remove the Acer Advance Server Management CD.

# 3 Upgrading

# Tools and Supplies Needed

- Jumper removal tool or needle nosed pliers
- Phillips† (cross head) screwdriver (#1 bit and #2 bit)
- Pen or pencil
- Antistatic wrist strap and conductive foam pad (recommended)

# Cautions

These warnings and cautions apply throughout this chapter. Only a technically qualified person should configure the server board.

**Cautions**:

**System power on/off**: The power button DOES NOT completely turn off the system AC power, 5V standby is still active whenever the system is plugged in. To remove power from system, you must unplug the AC power cord from the wall outlet. Make sure the AC power cord is unplugged before you open the chassis, add, or remove any components.

**Hazardous conditions, devices & cables**: Hazardous electrical conditions may be present on power, telephone, and communication cables. Turn off the server and disconnect the power cord, telecommunications systems, networks, and modems attached to the server before opening it. Otherwise, personal injury or equipment damage can result.

**Electrostatic discharge (ESD) & ESD protection**: ESD can damage disk drives, boards, and other parts. We recommend that you perform all procedures in this chapter only at an ESD workstation. If one is not available, provide some ESD protection by wearing an antistatic wrist strap attached to chassis ground (any unpainted metal surface) on your server when handling parts.

**ESD and handling boards**: Always handle boards carefully. They can be extremely sensitive to ESD. Hold boards only by their edges. After removing a board from its protective wrapper or from the server, place the board component side up on a grounded, static free surface. Use a conductive foam pad if available but not the board wrapper. Do not slide board over any surface.

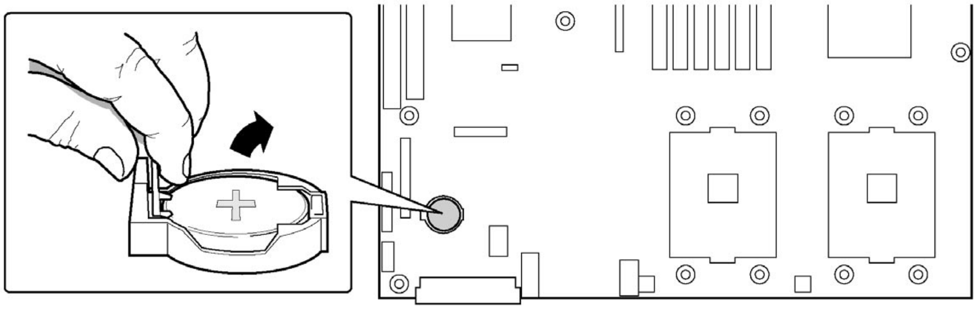
**Installing or removing jumpers**: A jumper is a small plastic encased conductor that slips over two jumper pins. Some jumpers have a small tab on top that you can grip with your fingertips or with a pair of fine needle nosed pliers. If your jumpers do not have such a tab, take care when using needle nosed pliers to remove or install a jumper; grip the narrow sides of the jumper with the pliers, never the wide sides. Gripping the wide sides can damage the contacts inside the jumper, causing intermittent problems with the function controlled by that jumper. Take care to grip with, but not squeeze, the pliers or other tool you use to remove a jumper, or you may bend or break the stake pins on the board.

# Replacing the Back up Battery

The lithium battery on the server board powers the real time clock (RTC) in the absence of AC power. When the battery starts to weaken, it loses voltage, and the server settings stored in CMOS RAM in the RTC (for example, the date and time) may be wrong. Contact your customer service representative or dealer for a list of approved devices.

To replace the battery:

1. Before proceeding, record your custom BIOS settings.
2. Observe the safety and ESD precautions at the beginning of this chapter.
3. Open the chassis and locate the battery.
4. Push the upper end of the metal retainer away from the battery-the battery pops up.
5. Remove the battery from its socket.
6. Dispose of the battery according to local ordinance.
7. Remove the new lithium battery from its package.
8. Being careful to observe the correct polarity, lay the battery in the socket.
9. Push the battery down-the metal retainer locks the battery in the socket.
10. Close the chassis.
11. Run Setup to restore the configuration settings to the RTC.
12. Restore your custom BIOS settings.



# 4 Configuration Software and Utilities

# Service Partition (Optional)

When you are setting up your server system, you can install a service partition onto your hard drive. The service partition includes utilities, and other software that be run locally or remotely to assist in system management. The service partition uses approximately 40 MB of hard disk space.

**Note**: It is highly recommended that you install the service partition before installing an operating system. For more information, see the Service Partition section in the Installation Guide for Acer Advance Server Management. This document is included on the ASMe CD shipped with your server board.

# Configuration Utilities

## System Software Update Sequence

When you update the system software, you should do it in the following order.

1. Update firmware (BMC & HSC)
2. Update FRU/SDR
3. Unplug system for 30 seconds
4. Update BIOS
5. Clear CMOS

Configuration Utilities Table:

| Utility | Description and brief procedure | Page |
|---|---|---|
| Adaptec SCSISelect Utility | Use to configure or view the settings of the SCSI host adapters and onboard SCSI devices in the system. | 54 |
| Direct Platform Control (DPC) Console | Use to access and monitor the server remotely. | 57 |
| System Setup Utility (SSU) and Client System Setup Utility (CSSU) | Use for viewing and configuring server management options, viewing the system event log (SEL), setting boot device priority, or setting system security options.<br>The SSU can run either from the configuration software CD or from a set of bootable diskettes. You can create the diskettes from the CD.<br>The CSSU is run from the service partition via the DPC console. It provides the same functionality as the SSU, but from a remote console.<br>Information entered via the SSU/CSSU overrides information entered via BIOS Setup. | 59 |
| BIOS Update Utility | Use to update the BIOS or recover from a corrupted BIOS update. | 65, 75 |

| **Utility** | **Description and brief procedure** | **Page** |
|---|---|---|
| Firmware Update Utility | Use to update BMC flash ROM or other firmware. | 76 |
| FRU/SDR Load Utility | Use to update the Field Replaceable Unit (FRU) and Sensor Data Record (SDR) flash components.<br>NOTE: You must run the FRU/SDR Load utility whenever the BMC is updated or if you change your processors. | 76 |

# Hot Keys

Use the numeric pad of the keyboard to enter numbers and symbols.

| To Do This: | Press These Keys |
|---|---|
| Secure your system immediately. | <Ctrl+Alt>+hot key (Set your hot key combination with the SSU or BIOS Setup) |
| Enter the Adaptec SCSI Utility during POST. | <Ctrl+A> (SCSI version only) |
| Enter the Promise Technology IDE RAID Utility. | <Ctrl+F> (ATA version only) |
| Enter BIOS Setup during POST. | <F2> |
| Abort memory test during POST. | <ESC> (Press while BIOS is updating memory size on screen) |
| Display a menu for selecting the boot device. | <ESC> (Press anytime after memory check) |
| To remove the splash screen. | <ESC> |

# Power-On Self-Test (POST)

Each time you turn on the system the BIOS begins execution of the Power-On Self-Test (POST). POST discovers, configures, and tests the processors, memory, keyboard, and most installed peripheral devices. The time needed to test memory depends on the amount of memory installed. POST is stored in flash memory.

1. Turn on your video monitor and system. After a few seconds, POST begins to run and displays a splash screen.
2. While the splash screen is displayed:
   - Press <F2> to enter the BIOS Setup (see "BIOS Setup")

     OR

   - Press <Esc> to view POST diagnostic messages and change the boot device priority for this boot only (see "Temporarily Changing the Boot Device Priority" on page 52).
3. After pressing <F2> or <Esc> during POST, you can press <Ctrl+A> to run the SCSISelect Utility. For more information, see"Running the Adaptec SCSISelect Utility" on page 54.
4. If you do not press <F2> or <Esc> and do NOT have a device with an operating system loaded, the boot process continues and the system beeps once. The following message is displayed:

   "***Operating System not found***"
5. At this time, pressing any key causes the system to attempt a reboot. The system searches all removable devices in the order defined by the boot priority.

# BIOS Setup

You can run BIOS Setup with or without an operating system being present. BIOS Setup stores most of the configuration values in battery-backed CMOS; the rest of the values are stored in flash memory. The values take effect when the system is booted. POST uses these values to configure the hardware. If the values and the actual hardware do not agree, POST generates an error message.

Record BIOS Setup Settings

Record your BIOS Setup settings. If default values ever need restoring (after a CMOS clear, for example), you must run BIOS Setup again. Your record will make this much easier.

## If BIOS Setup Is Inaccessible

If you have a misconfigured diskette drive, and you cannot use BIOS Setup to correct the problem, you might need to clear CMOS memory. To clear CMOS, either of two methods can be used.

1. Press the reset button and hold it down for four seconds or more, and then, while holding the reset button down, press the power button. Release both buttons at the same time.
2. Move the Clear CMOS jumper found on the configuration jumper block on the baseboard.

## Temporarily Changing the Boot Device Priority

During POST, you can change the boot device priority for the current boot process. The changes are not saved for the next boot process.

1. Boot the server.
2. At any time during POST, press <Esc>. When POST completes, a popup Boot menu displays.
3. Use the arrow keys to highlight the device you want the server system to boot from first. For example, if you want the server system to boot from the CD-ROM first, you select “ATAPI CD-ROM Drive.”

**Note**: One of the selections on the popup Boot menu is “Enter Setup.” Selecting this option brings you into the BIOS Setup.

4 Press <Enter>.

5 The boot process continues. When finished, a system prompt displays.

# Running the Adaptec SCSISelect Utility

Each host adapter includes an onboard SCSISelect configuration utility that allows you to configure/view the settings of the host adapter and devices in the server.

The system finds the Adaptec SCSI host adapter and displays the message Adaptec SCSI BIOS V x.xxx where x.xxx is the version number of the SCSISelect utility.

Pressing <Ctrl+A> at this time allows you to configure the Adaptec AIC-7XXX SCSI host adapter.

## When to Run the Adaptec SCSISelect Utility

Use the SCSISelect utility to:

- Change default values
- Check and/or change SCSI device settings that may conflict with those of other devices in the server
- Do a low-level format on SCSI devices installed in the server

## Running the SCSISelect Utility

1 When this message appears on the video monitor:

***<<<Press <Ctrl><A> for SCSISelect(TM) Utility!>>>***

2 Press <Ctrl+A> to run the utility. When the main menu for the host adapter appears, choose the device that you want to configure-each SCSI bus accepts up to 15 devices.

Use the following keys to navigate through the menus and submenus:

| Press | To |
|---|---|
| ESC | Exit the utility |
| Enter | Select an option |
| ↑ | Return to previous option |
| ↓ | Move to the next option |

| Press | To |
|---|---|
| F5 | Switch between color and monochrome |
| F6 | Reset to host adapter defaults |

# Configuring the Adaptec SCSI Adapter

The Adaptec SCSI adapter has two busses. Select the bus from the following menu:

| Menu Item | Options |
|---|---|
| You have an adapter in your system.<br>Move the cursor to the bus:device:channel of the one for configuration and press **Enter**. | Bus:Device:Channel<br>01:06:A<br>01:06:B |
| <F5> - Toggle color/monochrome. | |

After selecting the bus, the following menu displays:

| Host Adapter | Option | Comment |
|---|---|---|
| AIC-7XXX at Bus:Device:Channel 01:06:A (or 01:06:B) | Configure/View Host Adapter Settings | Press **Enter** to view the Configuration Menu. |
| | SCSI Distk Utilities | Press **Enter** to view the SCSI Disk Utilities Menu. This menu allows you to format hard disks and/or verify disk media. |

When you are finished, press **Esc>** and make your selection from the following menu:

| Feature | Option | Comment |
|---|---|---|
| Exit Utility? | Yes<br>No | When you finish configuring your SCSI devices, press **Esc**. Then select **Yes** and press **Enter**. When this message appears:<br>***Please press any key to reboot.***<br>Press any key, and the server reboots. |

# Direct Platform Control (DPC) Console

Direct Platform Control (DPC) Console is part of Acer Advance Server Management. Direct Platform Control is a server management application that supports remote system management via LAN, or an RS-232 serial connection to the server serial 2 port over a modem or a direct serial cable. The Direct Platform Control Console provides the ability for remote management of Acer servers via modem or LAN with a capability to run DOS-based programs.

DPC console runs on a client workstation. It communicates with a server by:

- Accessing the server management capabilities of the on-board NIC
- A Windows 2000 compatible modem.
- An RS-232 connection to the server's serial 2 port.

DPC Console is independent of the server operating system.

Even when the server is off, you can use DPC Console to verify the state of a server or diagnose a problem with the server hardware. DPC console features allows you to:

- Establish connection to remote servers
- Server Control: power on, power off, and reset operations
- Retrieve and display entries in the System Event Log (SEL)
- Retrieve and display Sensor Data Records (SDR)
- Retrieve and display Field Replaceable Unit (FRU) information
- Retrieve and display current Remote Sensor Access (RSA) information
- Access a phone book for remote connection management
- Remote control of the service partition
- File transfer from / to the server

## DPC Console Modes of Operation

There are four DPC console modes of operation:

- EMP mode. Access the DPC console features using the DPC console window menus and/or toolbar. Active when a connection is established through the EMP port.

- DPC over LAN mode. Access the DPC console features using the DPC console window menus and/or toolbar. Active when a connection is established through the LAN.
- Re-direct mode. Active when the server is running BIOS console redirection. In this mode, the DPC console launches a separate window. The window operates as an ANSI terminal and communicates with the server through the port. Character-based commands you type in the DPC Console go directly to the server, and the DPC Console displays the text that you would normally see on the server console.

  To use this mode, you must configure the Console Redirection option of BIOS Setup for Redirect mode. Enabling Console Redirection requires that the Boot Time Diagnostics Screen be Enabled in BIOS Setup. If the redirection window does not display information, the Console Redirection is either incorrectly configured or disabled, the EMP is disabled in BIOS Setup, or the server is in protected mode. For DPC to function, the server must NOT be in graphics mode.
- If the DPC console fails to connect in EMP within 10 seconds and the server can operate in Redirect mode, a prompt is displayed with the option to switch to Re-direct mode.
- Service Partition mode. Entered when the server reboots from the service partition and the DPC Console has successfully connected to the server through a modem. This mode allows running of DOS-based programs that are stored on the service partition and transferring of files.

## Running the DPC Console

For more information about setting up and running the DPC Console, see the document named “ASMe_Install_Guide.pdf.” This document is in the ASMe\DOCS directory on the ASMe CD accompanying the Altos R700 server board.

# Using the System Setup Utility

The System Setup Utility (SSU) is located on the System Resource CD-ROM shipped with the server.

Run the System Setup Utility to:

- Set boot device priority
- Set passwords and security options
- View system events
- View FRU information
- View sensor data records
- Update system firmware and BIOS
- Save and restore the system configuration
- Set up the server to send alerts for platform events
- Set up the server for remote management

Using either the System Setup Utility or BIOS Setup, you can specify the boot device sequence and set up system passwords and security options. Both utilities access the same stored configuration data for these items, and the result of making a change to these settings using either utility is identical.

The SSU consists of a collection of task-oriented modules plugged into a common framework called the Application Framework (AF). The Application Framework provides a launching point for individual tasks and a location for setting customization information.

## Creating SSU Diskettes

You can run the SSU directly from the Utilities menu of the System Resource CD-ROM, from a set of DOS diskettes, or from the service partition of the hard disk.

If you choose to run the SSU from a set of DOS diskettes, you must create the SSU diskettes from the Resource CD-ROM as follows:

1. Boot to the System Resource CD-ROM.
2. Choose Create Diskettes > Create Diskettes by Device/Function > System Setup Utility.
3. Follow the instructions displayed.

Alternatively, if you have a workstation with the Microsoft Windows operating system, you can insert the CD into that system and create the diskettes on that system.

## Running the SSU

When the SSU starts in the default local execution mode, the SSU accepts input from the keyboard or mouse. The SSU presents a VGA-based GUI on the primary monitor.

If you run the SSU from read-only media, such as the CD-ROM, you cannot save user preference settings (such as screen colors).

The SSU supports ROM-DOS version 6.22. The SSU will not operate from a “DOS box” running under an operating system such as Windows.

Start the SSU using one of the following methods:

- From diskettes: Insert the first SSU diskette in drive A and boot the server from the diskette.

  You are prompted to insert the second diskette. After loading completes the SSU starts automatically.
- From the System Resource or ASMe CD-ROM: Boot the server to the System Resource CD and start the SSU from the Utilities menu.
- From the Service Partition: Boot the server to the Service Partition and execute the following DOS commands:

```
C:\> cd ssu
C:\SSU> ssu.bat
```

The mouse driver loads if it is available; press **Enter** to continue.

When the SSU title appears on the screen, press **Enter** to continue.

### Working with the SSU Interface

You can access features of the SSU interface using the mouse or keyboard:

- **Mouse**-Click once to choose menu items and buttons or to select items in a list, such as the Available Tasks list. To run a list item, such as one of from the Available Tasks list, select the item and click OK or double-click the item.

- **Keyboard**-Use the tab and arrow keys to highlight buttons and press the spacebar or **Enter** to execute. You can also execute a menu or button by using the **Alt** key in combination with the underlined letter in the name of the menu or button.

You can have more than one task open at the same time, although some tasks might require complete control to avoid possible conflicts. The tasks achieve complete control by keeping the task as the center of operation until you close the task window.

The SSU has a build-in help system, which you access by clicking a Help button or choosing the Help menu.

## Customizing the SSU Interface

The SSU lets you customize your interface using the Preferences section of the main window. The AF sets these preferences and saves them in the AF.INI file so that they take effect the next time you start the SSU. There are four user customizable settings:

- Color-lets you change the default colors associated with different items on the screen using predefined color combinations. The color changes take effect immediately.
- Mode-lets you set the desired expertise level: novice, intermediate, or expert. The expertise level determines which tasks are visible in the Available Tasks section and which actions each task performs. For a new mode setting to take effect, you must exit the SSU and restart it.
- Language-lets you change the text in the SSU to the appropriate language. For a new language setting to take effect, you must exit the SSU and restart it.
- Other-lets you show or hide the status bar at the bottom of the SSU main window. The change takes effect immediately.

**Note**: If you run the SSU from read-only media (CD-ROM, for example), these preferences are lost when you exit the SSU.

## Exiting the SSU

Exiting the SSU closes all SSU windows.

# Setting Boot Device Priority

To change the boot priority of a device:

1 From the SSU Main window, choose **Boot Devices**.

2 In the Multiboot Options Add-in window, select a device.

3 Click the Move Up button to move it up in the list. Click the **Move Down** button to move it down.

# Setting Passwords and Security Options

You can set a user password and an administrator password. On some systems, you must set an administrator password before you can set a user password. On other systems, the passwords are independent. You can set the same passwords and security options by using BIOS Setup.

## Setting the Administrator Password

The Admin Password button lets you set or change the administrator password used by both the SSU and the system BIOS. This option is not available if both an administrator and a user password are set and you entered only the user password when you started the SSU. All changes to the administrator password take effect immediately.

To change or clear the administrator password:

1 From the SSU Main window, choose **Security**.

2 Click the **Admin Password** button.

3 If you are changing passwords, enter the old password.

4 Enter the new password (or leave blank to clear).

5 Confirm the password by entering it again (or leave blank to clear).

6 Click **OK** to save the password and return to the Security window.

## Setting the User Password

The User Password button lets you set or change the user password used by both the SSU and the system BIOS. All changes to the user password take effect immediately.

To change or clear the user password:

1 From the SSU Main window, choose **Security**.

2 Click the **User Password** button.

3 If you are changing passwords, enter the old password in the first box.

4 Enter the new password (or leave blank to clear).

5 Confirm the password by entering it again (or leave blank to clear).

6 Click **OK** to save the password and return to the Security window.

### Setting Security Options

For a description of security features, see “Security” on page 22.

To set the security options:

1 In the Security window, click the **Options** button.

2 For each option, select the desired setting from the list. The options are:

- **Security Hot Key**: The key combination that can be used to put the server into secure mode.
- **Secure Mode Timer**: If no keyboard or mouse activity occurs during the chosen time interval, the server enters secure mode.
- **Secure Mode Boot**: Enable forces the server to boot directly into secure mode.
- **Video Blanking**: Enable turns off the video when the server is in secure mode.
- **Floppy Write**: Enable prevents writing to the diskette drive while the server is in secure mode.
- **Power Switch Inhibit**: Enable prevents the power and reset buttons from functioning when the server is in secure mode. Disable allows the power and reset buttons to function normally when the server is in secure mode.

3 Click **Save** to save the settings and return to the Security window.

## Viewing the System Event Log

To view the System Event Log (SEL):

1 From the SSU Main window, choose SEL Manager.

When you start the SEL Manager, it automatically loads the current list of events from nonvolatile memory.

2 Use the **F4** and **F5** keys to scroll the window contents to the left and right to view all of the columns.

3 Use the File and SEL menu items to work with the SEL information:

- **Open**: Views data from a previously saved SEL file.
- **Save As**: Saves the currently loaded SEL data to a file.
- **Properties**: Displays information about the SEL.
- **Clear SEL**: Clears the SEL data from the nonvolatile storage area.
- **Reload**: Refreshes the display by reading the current SEL entries from the server.
- **Sort By**: Sorts the displayed events by event number, time stamp, sensor type and number, event description, or event generator ID.

## Viewing FRU Information

To view the Field Replaceable Unit (FRU) information:

1 From the SSU Main window, choose FRU Manager.

When you start the FRU Manager, it automatically loads the current list of events from nonvolatile memory.

The FRU Manager window has a navigation pane on the left that displays, in a tree format, the inventory of components in the server. The tree has three categories: Chassis, Board, and Product. Clicking on a category expands or collapses a list of components for that category. Clicking on an individual component displays the FRU information for that component in the presentation pane in the upper right. The description pane in the lower right displays a description of the currently selected FRU area.

2 Use the **F4** and **F5** keys to scroll the window contents to the left and right to view all of the columns.

3 Use the File and FRU menu items to work with the FRU information:

- **Open**: Views data from a previously saved FRU file.

- **Save As**: Saves the currently loaded FRU data to a file.
- **Properties**: Displays the number of FRU devices in the system and the number being displayed. Only FRU devices with valid FRU areas are displayed.
- **Reload**: Refreshes the display by reading the current FRU entries from the server.

## Viewing Sensor Data Records

To view the Sensor Data Records (SDR):

1 From the SSU Main window, choose SDR Manager.

When you start the SDR Manager, it automatically loads the SDR entries from non-volatile memory.

The SDR Manager window has a navigation pane on the left that displays, in a tree format, the sensor data records. The tree has categories for each type of record. Clicking on a category expands or collapses a list of SDRs for that category. Clicking on an individual SDR displays the information for that SDR in the presentation pane in the upper right. The description pane in the lower right displays a description of the currently selected SDR type.

2 Use the **F4** and **F5** keys to scroll the window contents to the left and right to view all of the columns.

3 Use the File and SDR menu items to work with the SDR information:

- **Open**: Views data from a previously saved SDR file.
- **Save As**: Saves the currently loaded SDR data to a file.
- **Properties**: Displays information about the SDR, including IPMI version, number of SDR entries, time stamps for changes to the SDR information, and free space remaining.
- **Reload**: Refreshes the display by reading the current SDR entries from the server.

## Updating System Firmware and BIOS

Using the SSU, you can update the BIOS, update the firmware, and verify the firmware. Procedures for each are given below. You can also update the BIOS and firmware without using the SSU.

## Updating the BIOS

To update the BIOS:

1 Download the update from the Acer support website.

2 From the SSU Main window, choose **System Update**. (System Update is available only in Expert mode.)

When you start System Update, it automatically displays the current revision information for the system firmware and BIOS.

3 From the File menu, choose **Load** and choose a **.uif** or **.bio** file to use for the update.

4 Click the **Update** button to update the BIOS.

## Updating the Firmware

To update the system firmware:

1 Download the update from the Acer support website.

2 From the SSU Main window, choose **System Update**. (System Update is available only in Expert mode.)

When you start System Update, it automatically displays the current revision information for the system firmware and BIOS.

3 From the File menu, choose **Load** and choose a **.uif** or **.hex** file to use for the update.

4 Click the **Update** button to perform the update.

## Verifying the Firmware

To compare the system firmware in nonvolatile memory with a firmware file:

1 Download the update from the Acer support website.

2 From the SSU Main window, choose **System Update**. (System Update is available only in Expert mode.)

When you start System Update, it automatically displays the current revision information for the system firmware and BIOS.

3 From the File menu, choose **Load** and choose a **.hex** file to use for the update.

4 Click the Verify button to compare the firmware code in nonvolatile storage with the selected file.

# Saving and Restoring the System Configuration

Using the SSU, you can save the following configuration information to a file:

- Platform type, BIOS revision, and firmware revision
- CMOS settings
- Extended system configuration data (ESCD)
- Settings for the emergency management port (EMP), platform event paging (PEP), and BMC LAN alerts

Data is saved from all sources. There is no way to choose only certain pieces of configuration data to save. You can also restore the information from a saved configuration file.

**Note**: BIOS passwords are stored in the file. Restoring a configuration can change passwords on a server. EMP and LAN passwords are not stored in the file.

## Saving a Configuration

To save the system configuration:

1. From the SSU Main window, choose **Config Save/Restore**. (Configuration Save/Restore is available only in Expert mode.)
2. Click **Save To File** and specify a filename and location.

## Restoring a Configuration

To restore the system configuration from a file:

1. From the SSU Main window, choose **Config Save/Restore**. (Configuration Save/Restore is available only in Expert mode.)

2. Click **Restore from File** and specify a filename and location.

   The CSR reads the platform type, BIOS revision, and firmware revision from the file and compares that information with the same information retrieved from the server. If the two do not match, an error message is displayed and the restore operation aborts. If they do match, the CSR restores the configuration data to the server. It prompts you to reboot the server for the new settings to take effect.

# Alerting for Platform Events

You can set up the server to alert you when various events occur. Alerts can be delivered either as telephone pages or over the LAN. Instructions for setting up both telephone paging alerts and LAN alerts are given below.

## Setting Up Paging Alerts

To set up the server to send alerts as telephone pages:

1. Install an external modem on the Emergency Management Port (serial 2).
2. From the SSU Main window, choose **Platform Event Manager** (PEM).
3. In the PEM window, click **Configure EMP**.
4. In the corresponding boxes, enter the following command strings for the modem attached to the EMP port (boxes that aren't listed here are not required for paging alerts):
   - **ESC Sequence**: the escape sequence. This string is sent to the modem before sending command strings. The maximum length for the string is five characters; longer strings are truncated.
   - **Hangup String**: hang up or drop the connection. The EMP automatically sends an <ENTER> character following this string. The maximum length for the string is eight characters; longer strings are truncated.
   - **Modem Dial Command**: the command to dial a phone number. This string is sent to the modem before sending the paging string.
   - **Modem Init String**: the initialization string for the modem. This string is sent every time the EMP initializes. The maximum length for the string is determined at run-time from firmware. You will be notified if the string is truncated. Following a save, the actual string saved is displayed in the edit box.
5. Click **Save** to save the changes.
6. Click **Close** to return to the PEM window.
7. In the PEM window, click Configure PEP.
8. Select the **Enable PEP** check box.

9 In the Blackout Period box, enter the minimum time, in minutes, between successive pages. The valid range is [0 - 255] where 0 disables the blackout period. Setting a blackout period can save you from being flooded with repeat pages. After you receive a PEP page, no additional pages are sent by PEP for the duration of the blackout period.

10 In the Paging String box, enter the phone number to dial for the page and the message you want sent with the page. The maximum length for the paging string is determined at run-time from firmware. You will be notified if the string is truncated. Following a save, the actual string saved is displayed in the edit box.

11 From the Options menu, choose Configure Event Actions.

12 In the Platform Event Paging Actions window, move the events that you want to generate an alert to the Enabled column and move all other events to the disabled column using the following buttons:

- >>: Moves all events from the enabled list to the disabled list.
- >: Moves the selected event from the enabled list to the disabled list.
- <: Moves the selected event from the disabled list to enabled the list.
- <<: Moves all events from the disabled list to the enabled list.

13 Click **Save** to save the changes.

14 Click **Close** to return to the PEP Configuration window.

15 To send a test page to verify that you have correctly configured PEP, from the Options menu, choose Send Alert.

16 Click **Save** to save the configuration.

17 Click **Close** to return to the Platform Event Manager window.

## Setting Up LAN Alerts

To set up the server to send alerts over the LAN:

1 Configure the remote system to receive alerts. For more information, see the documentation for Acer Advance Server Management software.

2 From the SSU Main window, choose **Platform Event Manager** (PEM).

3 In the PEM window, click **Configure LAN** and fill in the boxes described in the following steps (boxes that aren't listed here are not required for LAN alerts).

4 Select the **Enable LAN Alerts** check box.

5 (Optional) In the SNMP Community String box, enter a string for the community field in the Header section of the SNMP trap sent for an alert. The string must be from 5 to 16 characters.

The default string is public.

6 In the IP Setup box, choose either:

- **DHCP**: the IP address for the server is automatically assigned by the DHCP (dynamic host control protocol) server on the network. The Host, Gateway, and Subnet Mask boxes in the dialog are ignored.
- **Static**: assign the IP address for the server using the Host, Gateway, and Subnet Mask boxes in the dialog.

7 If you chose Static IP Setup in the previous step, fill in the IP addressing boxes:

- Host IP Address: the IP address of this server.
- Gateway IP Address: the IP address of the router for this server.
- Subnet Mask: the IP address for the server's subnet. The server uses this to decide if the alert destination is on the same subnet.

8 In the Alert IP Address box, fill in the IP address of the system you want to receive alerts from this server. If you want the alert to be broadcast to an entire subnet, enter the IP address for the subnet.

9 From the Options menu, choose **Configure Event Actions**.

10 In the BMC LAN Alerting Actions window, move the events that you want to generate an alert to the Enabled column and move all other events to the disabled column using the following buttons:

- >>: Moves all events from the enabled list to the disabled list.
- >: Moves the selected event from the enabled list to the disabled list.
- <: Moves the selected event from the disabled list to enabled the list.
- <<: Moves all events from the disabled list to the enabled list.

11 Click **Save** to save the changes.

12 Click **Close** to return to the BMC LAN Configuration window.

13 To send a test alert to verify that you have correctly configured BMC LAN alerts, from the Options menu, choose **Send Alert**.

14 Click **Save** to save the changes.

15 Click **Close** to return to the PEM window.

# Managing the Server Remotely

You can set up the server so that you can connect to it from a remote client system to perform management tasks. You can make the connection over a LAN or by using a modem or direct serial cable to the Emergency Management Port (EMP). Instructions for setting up the server for remote LAN and serial/modem access are given below.

## Setting Up Remote LAN Access

To configure remote LAN access:

1 From the SSU Main window, choose Platform Event Manager (PEM).

2 In the PEM window, click Configure LAN and fill in the boxes described in the following steps (boxes that aren’t listed here are not required for remote access).

3 To require a password for remote access, enter the password in the Enter New Password box and in the Verify New Password box. Passwords can be from 1 to 16 characters long, using any ASCII character in the range [32-126]. To clear the passwords, leave both boxes blank. (You can also clear the password by choose the menu Options > Clear LAN Password.)

4 From the LAN Access Mode list, select the remote access mode:

- **Full Access**: a remote system can initiate a LAN connection regardless of the state or health of the server.
- **Restricted**: a remote system can initiate a LAN connection, but cannot perform control operations such as power down, reset, or front panel NMI.
- **Disabled**: remote systems are not allowed to initiate LAN connections.

5 In the IP Setup box, choose either:

- **DHCP**: the IP address for the server is automatically assigned by the DHCP (dynamic host control protocol) server on the network. The Host, Gateway, and Subnet Mask boxes in the dialog are ignored.
- **Static**: assign the IP address for the server using the Host, Gateway, and Subnet Mask boxes in the dialog.

6 If you chose Static IP Setup in the previous step, fill in the IP addressing boxes:

- **Host IP Address**: the IP address of this server.
- **Gateway IP Address**: the IP address of the router for this server.
- **Subnet Mask**: the IP address for the server's subnet. The server uses this to decide if the alert destination is on the same subnet.

7 Click **Save** to save the changes.

8 Click **Close** to return to the PEM window.

## Setting Up Remote Modem or Serial Access

To configure remote modem or serial access:

1 From the SSU Main window, choose Platform Event Manager (PEM).

2 In the PEM window, click Configure EMP and fill in the boxes described in the following steps (boxes that aren't listed here are not required for remote access).

3 To require a password for remote access, enter the password in the Enter New Password box and in the Verify New Password box. Passwords can be from 1 to 16 characters long, using any ASCII character in the range [32-126]. To clear the passwords, leave both boxes blank. (You can also clear the password by choose the menu Options > Clear LAN Password.)

4 In the Modem Ring Time box, enter the number of 500ms intervals that the BMC should wait before taking control of the serial 2 port and answering an incoming call. A value greater than zero gives the BIOS time to answer before the BMC takes control. A value of zero causes the BMC to answer immediately. The maximum value, 63, tells the BMC to ignore the call. Modem Ring Time applies only to Preboot access mode and is ignored for other access modes.

5 In the System Phone Number box, enter the number for the phone line connected to the modem on the EMP.

6 From the Access Mode list, choose the remote access mode:

- **Always Active**: the EMP is available at any time.
- **Preboot**: the EMP is available only when the server is powered down or is in the running POST during startup.
- **Disabled**: remote systems are not allowed to initiate connections.

7 From the Restricted Mode list, choose either:

- **Enabled**: a remote system can initiate a connection, but cannot perform control operations such as power down, reset, or front panel NMI.
- **Disabled**: the remote system has full control of the server.

8 From the Connection Mode list, choose either:

- **Direct Connect**: the serial 2 port on the server is connected by a serial cable to the remote system.
- **Modem Connect**: the serial 2 port on the server is connected to a modem.

9 Click **Save** to save the changes.

10 Click **Close** to return to the PEM window.

# Software Updates

Your system comes with preinstalled system BIOS and BMC firmware.

## Creating a Bootable Diskette

Each update diskette created must be made bootable with ROM-DOS Ver. 6.22 or MS-DOS Ver. 6.22.

**Note**: It is recommended that the target system be booted with the Resource CD that accompanied the product. However, the process for making the diskettes is the same for all the compatible versions of DOS. ROM-DOS Ver. 6.22 is included on the Resource CD.

1. Insert and boot to the Resource CD.
2. Exit from the menu to a DOS prompt.
3. Insert a diskette into the floppy drive.
4. At the DOS prompt, for an unformatted diskette, type:

   ***format a:/s***

   or, for a formatted diskette, type:

   ***sys a:***
5. Press **Enter**.

## Software Update Package

1. Download the software update.
2. Print, review, and follow the instruction file (it supercedes any other instructions).

**Note**: Be sure to record the current custom BIOS settings. They will be cleared and reset to their default values during the BIOS update portion of the operation. You will need these settings to configure your computer at the end of the update procedure. To record the current custom settings, boot the computer and press **F2** when you see the splash screen. Write down the current custom settings in the BIOS Setup program.

# Recovering the BIOS

It is unlikely that anything will interrupt the BIOS upgrade; however, an interruption could damage the BIOS. The following steps explain how to recover the BIOS if an upgrade fails. The following procedure uses recovery mode for the Setup program.

**Note**: Because of the small amount of code available in the non-erasable boot block area, there is no video support. You will not see anything on the screen during the procedure. Monitor the procedure by listening to the speaker and looking at the floppy drive LED.

1 Turn off all connected peripherals, turn off system power, and disconnect the AC power cord.

2 Remove the access cover and expose the server board. For instructions, see the product guide accompanying your chassis.

3 Move the Recovery Boot (RCVRY BOOT) jumper from its normal position to the BIOS recovery position (see “Server Board Jumpers” on page 97).

4 Reinstall the access cover and connect the power cord.

5 Insert the diskette holding the BIOS upgrade and recovery files into drive A.

6 Turn on system power and listen to the speaker:

- Two beeps indicate successful BIOS recovery-Go to the next step.
- A series of continuous beeps indicates failed BIOS recovery-Return to Step 1 and repeat the recovery process.

7 Turn off system power and disconnect all AC power cords.

8 Remove the access cover.

9 Move the Recovery Boot jumper back to its normal position.

10 Reinstall the access cover.

11 Connect all AC power cords and turn on system power.

# Firmware Update Utility Description

The Firmware Update Utility is a DOS-based program used to update the BMCs firmware code. You need to run the utility only if new firmware code is necessary.

## Running the Firmware Update Utility

Review the release notes before proceeding.

1. Create a DOS-bootable diskette. The version of DOS must be 6.22 or higher.
2. Place the firmware update utility (FWUPDATE.EXE) and the *.hex file on the diskette. Make a note of the *.hex file name, because you will need it later.
3. Insert the diskette into the drive and boot to it.
4. At the DOS prompt, run the executable file (FWUPDATE.EXE).
5. The utility displays a menu screen. Select **Upload Flash**.
6. The utility asks for a file name. Enter the name of the ***.hex** file.
7. The program will load the file and then ask if it should upload boot code. Press **N** to continue unless otherwise directed by the release notes or an Acer support professional.
8. The program next asks if it should upload operational code. Press **Y** to continue. The process of uploading operational code takes a few minutes.
9. Once the operational code updates and verifies, press any key to continue. Then press **ESC** to exit the program.
10. Shut the system down and remove any diskettes in the system.
11. Disconnect the AC power cord from the system and wait 30 seconds.
12. Reconnect the AC power cord and power up the system.

## FRU/SDR Load Utility Description

The Field Replaceable Unit (FRU) and Sensor Data Record (SDR) load utility is a DOS-based program used to update the server management subsystem’s product level FRU and SDR nonvolatile storage components (EEPROMs). The utility:

- Discovers the product configuration based on instructions in a master configuration file
- Displays the FRU information
- Updates the EEPROM associated with the Baseboard Management Controller (BMC) that holds the SDR and FRU area
- Generically handles FRU devices that might not be associated with the BMC

## What You Need to Do

Either run the utility directly from the Resource CD or from diskettes created from the CD.

If you run the FRU/SDR Load Utility from a diskette, copy the utility from the CD. Follow the instructions in the included README.TXT file.

If the diskette drive is disabled, or improperly configured, use BIOS Setup to enable it. If necessary, disable the drive after you are done with the FRU/SDR Load Utility.

## How You Use the FRU/SDR Load Utility

The utility:

- Is compatible with ROM-DOS Ver. 6.22, MS-DOS Ver. 6.22 (and later versions), Windows 95 DOS, and Windows 98 DOS
- Accepts CFG, SDR, and FRU load files (the executable file for the utility is FRU/SDR.exe)
- Requires the following supporting files:
  - One or more .fru files describing the system's field replaceable units
  - A .cfg file describing the system configuration
  - An .sdr file describing the sensors in the system

### Command Line Format

If you are not performing an automated update using a Software Update Package (SUP), the basic command line format is:

***FRU/SDR [-?] [-h] [-d {fru, sdr}] [-cfg filename.cfg] [-fru filename.fru]***

Command Line Format table:

| Command | Description |
|---|---|
| -? or -h | Displays usage information. |
| -d {fru, sdr} | Displays requested area only. |
| -cfg filename.cfg | Uses custom CFG file. |
| -p | Pause between blocks data. |

### Parsing the Command Line

The FRU/SDR load utility allows only one command line function at a time. A command line function can consist of two parameters. Example: -cfg filename.cfg. Invalid parameters cause an error message and exit the program. You can use either a slash (/) or a minus sign (-) to specify command line options. Use the -p and flags with any of the other options.

### Displaying a Given Area

When the utility is run with the -d FRU or -d SDR command line flag, information about each area is read from memory and printed on the screen. Each area represents one sensor for each instrumented device in the server. If the given display function fails because of an inability to parse the data present or a hardware failure, the utility displays an error message and exits.

### Using Specified CFG File

Run the utility with the command line parameter of -cfg filename.cfg. The filename can be any DOS-accepted, eight-character filename string. The utility loads the specified CFG file and uses the entries in that file to probe the hardware and to select the proper SDRs to load into nonvolatile storage.

### Displaying Utility Title and Version

The utility displays its title:

FRU & SDR Load Utility, Version Y.Y, Revision X.XX where Y.Y is the version number and X.XX is the revision number for the utility.

### Configuration File

The configuration file is in ASCII text. The utility executes commands formed by the strings present in the configuration file. These commands cause the utility to run tasks needed to load the proper SDRs into the nonvolatile storage of the BMC and possibly generic FRU devices. Some of the commands may be interactive and require you to make a choice.

### Prompting for Product Level FRU Information

With a configuration file, the utility might prompt you for FRU information.

### Filtering Records from the SDR File

The MASTER.SDR file has all the possible SDRs for the system. You might need to filter these records based on the current product configuration. The configuration file directs the filtering of the SDRs.

### Updating the SDR Nonvolatile Storage Area

After the utility validates the header area of the supplied SDR file, it updates the SDR repository area. Before programming, the utility clears the SDR repository area. The utility filters all tagged SDRs depending on the product configuration set in the configuration file. Untagged SDRs come automatically programmed. The utility also copies all written SDRs to the SDR.TMP file; it contains an image of what was loaded. The TMP file is also useful for debugging the server.

### Updating FRU Nonvolatile Storage Area

After the configuration is determined, the utility updates the FRU nonvolatile storage area. First, it verifies the common header area and checksum from the specified FRU file. The internal use area reads out of the specified .FRU file then programmed into the nonvolatile storage. The chassis area reads out of the specified .FRU file. Finally, it reads the product area out of the specified FRU file, then the area programs into the FRU nonvolatile storage. All areas write to the FRU.TMP file.

# 5 Solving Problems

This chapter helps you identify and solve problems that might occur while you are using the system.

## Resetting the System

| **To do this:** | **Press:** |
|---|---|
| Soft boot reset, which clears system memory and reloads the operating system. | Ctrl+Alt+Del |
| Clear system memory, restart POST, and reload the operating system | Reset button |
| Cold boot reset. Turn the system power off and then on. This clears system memory, restarts POST, reloads the operating system, and halts power to all peripherals. | Power off/on |

# Initial System Startup

Problems that occur at initial system startup are usually caused by incorrect installation or configuration. Hardware failure is a less frequent cause.

## Checklist

- Are all cables correctly connected and secured?
- Are the processors fully seated in their sockets on the server board?
- Are all add-in PCI boards fully seated in their slots on the server board?
- Are all jumper settings on the server board correct?
- Are all jumper and switch settings on add-in boards and peripheral devices correct? To check these settings, refer to the manufacturer's documentation that comes with them. If applicable, ensure that there are no conflicts-for example, two add-in boards sharing the same interrupt.
- Are all DIMMs installed correctly?
- Are all peripheral devices installed correctly?
- If the system has a hard disk drive, is it properly formatted or configured?
- Are all device drivers properly installed?
- Are the configuration settings made in BIOS Setup correct?
- Is the operating system properly loaded? Refer to the operating system documentation.
- Did you press the system power on/off switch on the front panel to turn the server on (power on light should be lit)?
- Is the system power cord properly connected to the system and plugged into a NEMA 5-15R outlet for 100-120 V (or a NEMA 6-15R outlet for 200-240 V)
- Is AC power available at the wall outlet?
- Are all integrated components from the tested components lists? Check the tested memory, and chassis lists, as well as the supported

hardware and operating system list on the Acer Customer Support website.

# Running New Application Software

Problems that occur when you run new application software are usually related to the software. Faulty equipment is much less likely, especially if other software runs correctly.

## Checklist

- Does the system meet the minimum hardware requirements for the software? See the software documentation.
- Is the software an authorized copy? If not, get one; unauthorized copies often do not work.
- If you are running the software from a diskette, is it a good copy?
- If you are running the software from a CD-ROM disk, is the disk scratched or dirty?
- If you are running the software from a hard disk drive, is the software correctly installed?

  Were all necessary procedures followed and files installed?
- Are the correct device drivers installed?
- Is the software correctly configured for the system?
- Are you using the software correctly?

If the problems persist, contact the software vendor's customer service representative.

# After the System Has Been Running Correctly

Problems that occur after the system hardware and software have been running correctly often indicate equipment failure. Many situations that are easy to correct, however, can also cause such problems.

## Checklist

- If you are running the software from a diskette, try a new copy of the software.
- If you are running the software from a CD-ROM disk, try a different disk to see if the problem occurs on all disks.
- If you are running the software from a hard disk drive, try running it from a diskette. If the software runs correctly, there may be a problem with the copy on the hard disk drive. Reinstall the software on the hard disk, and try running it again. Make sure all necessary files are installed.
- If the problems are intermittent, there may be a loose cable, dirt in the keyboard (if keyboard input is incorrect), a marginal power supply, or other random component failures.
- If you suspect that a transient voltage spike, power outage, or brownout might have occurred, reload the software and try running it again. (Symptoms of voltage spikes include a flickering video display, unexpected system reboots, and the system not responding to user commands.)

**Note**: Random errors in data files: If you are getting random errors in your data files, they may be getting corrupted by voltage spikes on your power line. If you are experiencing any of the above symptoms that might indicate voltage spikes on the power line, you may want to install a surge suppressor between the power outlet and the system power cord.

# More Problem Solving Procedures

This section provides a more detailed approach to identifying a problem and locating its source.

Preparing the System for Diagnostic Testing

**Caution**: **Turn off devices before disconnecting cables**: Before disconnecting any peripheral cables from the system, turn off the system and any external peripheral devices. Failure to do so can cause permanent damage to the system and/or the peripheral devices.

1 Turn off the system and all external peripheral devices. Disconnect all of them from the system, except the keyboard and video monitor.

2 Make sure the system power cord is plugged into a properly grounded AC outlet.

3 Make sure your video display monitor and keyboard are correctly connected to the system.

Turn on the video monitor. Set its brightness and contrast controls to at least two thirds of their maximum ranges (see the documentation supplied with your video display monitor).

4 If the operating system normally loads from the hard disk drive, make sure there is no diskette in drive A. Otherwise, place a diskette containing the operating system files in drive A.

5 Turn on the system. If the power LED does not light, see “Power Light Does Not Light” on page 89.

6 If errors are encountered, power off the system and remove all add-in cards.

## Monitoring POST

See “Power-On Self-Test (POST)” on page 51.

## Verifying Proper Operation of Key System Lights

As POST determines the system configuration, it tests for the presence of each mass storage device installed in the system. As each device is checked, its activity light should turn on briefly. Check for the following:

- Does the diskette drive activity light turn on briefly? If not, see “Diskette Drive Activity Light Does Not Light” on page 91.
- If a second diskette drive is installed, does its activity light turn on briefly? If not, see “Diskette Drive Activity Light Does Not Light” on page 91.

## Confirming Loading of the Operating System

Once the system boots up, the operating system prompt appears on the screen. The prompt varies according to the operating system. If the operating system prompt does not appear, see “Initial System Startup” on page 83.

# Specific Problems and Corrective Actions

This section provides possible solutions for these specific problems:

- Power light does not light.
- There is no beep or an incorrect beep pattern.
- No characters appear on screen.
- Characters on the screen appear distorted or incorrect.
- System cooling fans do not rotate.
- Diskette drive activity light does not light.
- CD-ROM drive activity light does not light.
- There are problems with application software.
- The bootable CD-ROM is not detected.

Try the solutions in the order given. If you cannot correct the problem, contact your service representative or authorized dealer for help.

## Power Light Does Not Light

Check the following:

- Is the system operating normally? If so, the power LED is probably defective or the cable from the front panel to the server board is loose.
- Are there other problems with the system? If so, check the items listed under “System Cooling Fans Do Not Rotate Properly.”

If all items are correct and problems persist, contact your service representative or authorized dealer for help.

## No Characters Appear on Screen

Check the following:

- Is the keyboard functioning? Check to see that the “Num Lock” light is functioning.
- Is the video monitor plugged in and turned on?
- Are the brightness and contrast controls on the video monitor properly adjusted?

- Are the video monitor switch settings correct?
- Is the video monitor signal cable properly installed?
- Is the onboard video controller enabled?

If you are using an add-in video controller board, do the following:

1. Verify that the video controller board is fully seated in the server board connector.
2. Reboot the system for changes to take effect.
3. If there are still no characters on the screen after you reboot the system and POST emits a beep code, write down the beep code you hear. This information is useful for your service representative.
4. If you do not receive a beep code and characters do not appear, the video display monitor or video controller may have failed. Contact your service representative or authorized dealer for help.

## Characters Are Distorted or Incorrect

Check the following:

- Are the brightness and contrast controls properly adjusted on the video monitor? See the manufacturer’s documentation.
- Are the video monitor signal and power cables properly installed?

If the problem persists, the video monitor may be faulty or it may be the incorrect type. Contact your service representative or authorized dealer for help.

## System Cooling Fans Do Not Rotate Properly

If the system cooling fans are not operating properly, system components could be damaged.

Check the following:

- Is AC power available at the wall outlet?
- Is the system power cord properly connected to the system and the wall outlet?
- Did you press the power button?
- Is the power on light lit?
- Have any of the fan motors stopped (use the server management subsystem to check the fan status)?

- Are the fan power connectors properly connected to the server board?
- Is the cable from the front panel board connected to the server board?
- Are the power supply cables properly connected to the server board?
- Are there any shorted wires caused by pinched cables or power connector plugs forced into power connector sockets the wrong way?

If the switches and connections are correct and AC power is available at the wall outlet, contact your service representative or authorized dealer for help.

## Diskette Drive Activity Light Does Not Light

Check the following:

- Are the diskette drive power and signal cables properly installed?
- Are all relevant switches and jumpers on the diskette drive set correctly?
- Is the diskette drive properly configured?
- Is the diskette drive activity light always on? If so, the signal cable may be plugged in incorrectly.
- If you are using the onboard diskette controller, use the Setup Utility to make sure that “Onboard Floppy” is set to “Enabled.” If you are using an add-in diskette controller, make sure that “Onboard Floppy” is set to “Disabled.”

If the problem persists, there may be a problem with the diskette drive, server board, or drive signal cable. Contact your service representative or authorized dealer for help.

## CD-ROM Drive Activity Light Does Not Light

Check the following:

- Are the power and signal cables to the CD-ROM drive properly installed?
- Are all relevant switches and jumpers on the drive set correctly?
- Is the drive properly configured?

- Is the onboard IDE controller enabled?

## Problems with Application Software

If you have problems with application software, do the following:

- Verify that the software is properly configured for the system. See the software installation and operation documentation for instructions on setting up and using the software.
- Try a different copy of the software to see if the problem is with the copy you are using.
- Make sure all cables are installed correctly.
- Verify that the server board jumpers are set correctly. See “6 Technical Reference” on page 95.
- If other software runs correctly on the system, contact your vendor about the failing software.
- If the problem persists, contact the software vendor’s customer service representative for help.

## Bootable CD-ROM Is Not Detected

Check the following:

- Is the BIOS set to allow the CD-ROM to be the first bootable device?
- Check cable connections.
- Verify CD is bootable in another known good CD-ROM drive. (Especially if the CD is a copy.)

# Problems with Network

## The server hangs when the drivers are loaded:

- Change the PCI BIOS interrupt settings.

## Diagnostics pass, but the connection fails:

- Make sure the network cable is securely attached.
- Make sure you specify the correct frame type in your NET.CFG file.

## The Activity LED doesn’t light:

- Make sure the network hub has power.

## The controller stopped working when an add-in adapter was installed:

- Make sure the cable is connected to the port from the onboard network controller.
- Make sure your PCI BIOS is current.
- Make sure the other adapter supports shared interrupts. Also, make sure your operating system supports shared interrupts.
- Try reseating the add in adapter.

## The add-in adapter stopped working without apparent cause:

- Try reseating the adapter first; then try a different slot if necessary.
- The network driver files may be corrupt or deleted. Delete and then reinstall the drivers.
- Run the diagnostics.

## Cannot Connect to a Server

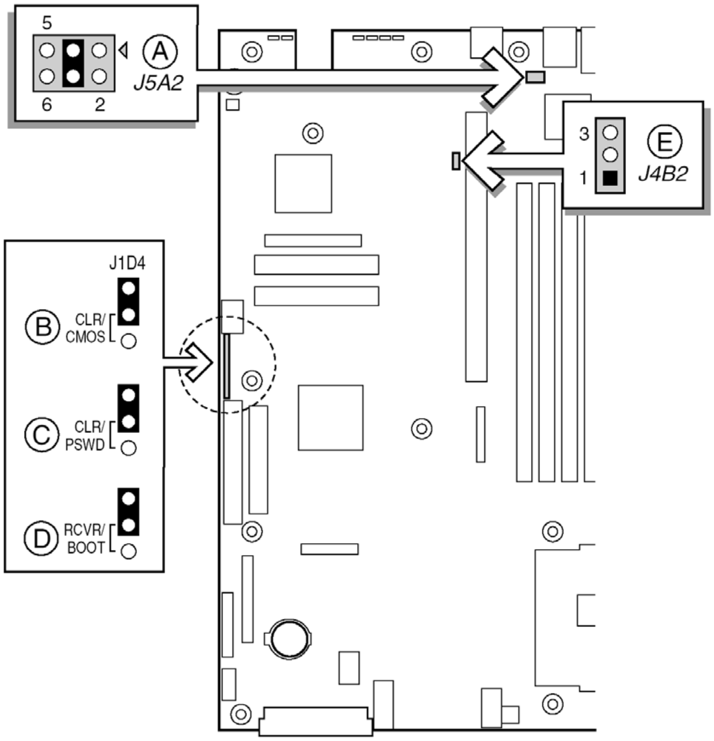
- Make sure you are using the drivers that are shipped on the System Resource CD for the onboard network controller.
- Make sure the driver is loaded and the protocols are bound.
- Make sure the network cable is securely attached to the connector at the system back panel. If the cable is attached but the problem

persists, try a different cable.

- Make sure the hub port is configured for the same duplex mode as the network controller.
- Check with your LAN administrator about the correct networking software that needs to be installed.
- If you are directly connecting two servers (no hub), you will need a crossover cable (see your hub documentation for more information on crossover cables).
- Check the network controller LEDs that are visible through an opening at the system back panel.

# 6 Technical Reference

# Server Board Jumpers


5
6
2
A
J5A2
3
1
E
J4B2
J1D4
B
CLR/
CMOS
C
CLR/
PSWD
D
RCVR/
BOOT

| Label | Jumper Name | What it does at system reset |
|---|---|---|
| A | RJ-45 Serial Port Config | Configures either a DSR or a DCD signal to the connector. See “RJ-45 Serial Port” on page 15. |
| B | CMOS CLR | If these pins are jumpered, the CMOS settings are cleared. These pins should not be jumpered for normal operation. |
| C | PSWD CLR | If these pins are jumpered, the password is cleared. These pins should not be jumpered for normal operation. |

| Label | Jumper Name | What it does at system reset |
|---|---|---|
| D | RCVRY BOOT | If these pins are jumpered, the system will attempt BIOS recovery. These pins should not be jumpered for normal operation. |
| E | BMC Boot Block Write Enable | If these pins are jumpered, BMC boot block is erasable and programmable at next reset. These pins should not be jumpered for normal operation. |

# Diagnostic LEDs

To help diagnose POST failures, a set of four bi-color diagnostic LEDs is located on the back edge of the baseboard. Each of the four LEDs can have one of four states: Off, Green, Red, or Amber.

The LED diagnostics feature consists of a hardware decoder and four dual color LEDs. During POST, the LEDs will display all normal Port80 codes representing the progress of the BIOS POST. Each postcode will be represented by a combination of colors from the 4 LEDs. The LEDs are in pairs of green and red. The post codes are broken into two nibbles, an upper and a lower nibble. Each bit in the upper nibble is represented by a red LED and each bit in the lower nibble is represented by a green LED. If both bits are set in the upper and lower nibble then both red and green LEDs are lit, resulting in an amber color. Likewise, if both bits are clear then the red and green LEDs are off.

During the POST process, each light sequence represents a specific Port-80 POST code. If a system should hang during POST, the Diagnostic LEDs will present the last test executed before the hang. When reading the lights, the LEDs should be observed from the back of the system. The most significant bit (MSB) is the first LED on the left, and the least significant bit (LSB) is the last LED on the right.

**Note**: When comparing a diagnostic LED color string from the baseboard to those listed in the diagnostic LED decoder in the following tables, the LEDs on the baseboard should be referenced when viewed by looking into the system from the back. Reading the LEDs from left to right, the Hi bit is located on the left.

Post Code table:

| Post Code | Diagnostic LED Decoder | | | | Description |
|---|---|---|---|---|---|
| | G=Green,R=Red,A=Amber | | | | |
| | MSB | | | LSB | |
| 07h | Off | G | G | G | Uncompress various BIOS Modules. |
| 08h | G | Off | Off | Off | Verify password Checksum. |

| Post Code | Diagnostic LED Decoder<br>G=Green,R=Red,A=Amber | | | | Description |
|---|---|---|---|---|---|
| | MSB | | | LSB | |
| 08h | G | Off | Off | Off | Verify CMOS Checksum. |
| 07h | Off | G | G | G | Read Microcode updates from BIOS ROM. |
| 07h | Off | G | G | G | Initializing the processors. Set up processor registers. Select least featured processor as the BSP. |
| 0Bh | G | Off | G | G | Hook before the keyboard BAT command is issued. |
| 0Ch | G | G | Off | Off | Keyboard Controller Test: The keyboard controller input buffer is free. Next, issuing the BAT command to the keyboard controller. |
| 0Eh | G | G | G | Off | Init after Keyboard Test: The keyboard controller BAT command result has been verified. Next, performing any necessary initialization after the keyboard controller BAT command test. |
| 0Fh | G | G | G | G | Write Command Byte 8042: The initialization after the keyboard controller BAT command test is done. The keyboard command byte will be written next. |
| 10h | Off | Off | Off | R | Keyboard Init: The keyboard controller command byte is written. Next, issuing the pin 23 and 24 blocking and unblocking commands. |
| 10h | Off | Off | Off | R | Disable and initialize 8259. |

| Post Code | Diagnostic LED Decoder | | | | Description |
|---|---|---|---|---|---|
| | G=Green,R=Red,A=Amber | | | | |
| | MSB | | | LSB | |
| 11h | Off | Off | Off | A | Detect Configuration Mode, such as CMOS clear. |
| 13h | Off | Off | G | A | Chipset Initialization before CMOS initialization. |
| 19h | G | Off | Off | A | Init System Timer: The 8254 timer test is over. Starting the memory refresh test next. |
| 1Ah | G | Off | G | R | Check Refresh Toggle: The memory refresh line is toggling. Checking the 15 second on/off time next. |
| 23h | Off | Off | A | G | Setup Interrupt Vectors: Reading the 8042 input port and disabling the MEGAKEY Green PC feature next. Making the BIOS code segment writable and performing any necessary configuration before initializing the interrupt vectors. |
| 24h | Off | G | R | Off | Before Vector: Configuration is required before interrupt vector initialization has completed. Interrupt vector initialization is about to begin. |
| 25h | Off | G | R | G | Init interrupt Vectors: Interrupt vector initialization is done. |
| F2h | R | R | A | R | Initialize SMM handler. Initialize USB emulation. |
| F5h | R | A | R | A | Validate NVRAM areas. Restore from backup if corrupted. |

| Post Code | Diagnostic LED Decoder | | | | Description |
|---|---|---|---|---|---|
| | G=Green,R=Red,A=Amber | | | | |
| | MSB | | | LSB | |
| 12h | Off | Off | G | R | Load defaults in CMOS RAM if bad checksum or CMOS clear jumper is detected. |
| 12h | Off | Off | G | R | Initializing APP CMOS RAM for appliance servers only. |
| 12h | Off | Off | G | R | Check point After CMOS Initialized. |
| 27h | Off | G | A | G | Validate date and time in RTC. |
| F4h | R | A | R | R | Load Micro Code To All CPUs. |
| F6h | R | A | A | R | Scan SMBIOS GPNV areas. |
| 15h | Off | G | Off | A | 8254 Timer Test on Channel 2. |
| 15h | Off | G | Off | A | Enable 8042. |
| 15h | Off | G | Off | A | Keyboard Reset. |
| 26h | Off | G | A | Off | Initialize LCD, if supported. |
| 28h | G | Off | R | Off | Set Video Mode: Initialization before setting the video mode is complete. Configuring the monochrome mode and color mode settings next. |
| 29h | G | Off | R | G | Debugger Hook. |
| 2Ah | G | Off | A | Off | Init PCI devices and motherboard devices. Pass control to video BIOS. Start serial console redirection. |
| 2Bh | G | Off | A | G | Platform hook. |

| Post Code | Diagnostic LED Decoder<br>G=Green,R=Red,A=Amber<br>MSB | | | LSB | Description |
|---|---|---|---|---|---|
| 2Dh | G | G | R | G | Initialize AMI display manager Module. Initialize support code for headless system if no video controller is detected. |
| 2Dh | G | G | R | G | Scan flash for logos and Initialize logo data areas. |
| 30h | Off | Off | R | R | Detect PS/2 Mouse. |
| 30h | Off | Off | R | R | Hook after c000 ROM control. |
| 2Eh | R | R | A | Off | Set up video parameters in BIOS data area. |
| 37h | Off | G | A | A | Activate ADM: The display mode is set. Displaying the power-on message next. |
| 37h | Off | G | A | A | Initialize language module. Display splash logo. |
| 37h | Off | G | A | A | Display Sign on message, BIOS ID and processor information. |
| 38h | G | Off | R | R | Detect USB Mouse: Initializing the bus input, and general devices next, if present. |
| 34h | Off | G | R | R | Reset IDE Controllers. |
| 39h | G | Off | R | A | Displaying bus initialization error messages. |
| 3Ah | G | Off | A | R | Display Setup Message: The new cursor position has been read and saved. Displaying the Hit Setup message next. |
| 40h | Off | R | Off | Off | Ensure Timer Keyboard Interrupts are on. |

| Post Code | Diagnostic LED Decoder G=Green,R=Red,A=Amber | | | | Description |
|---|---|---|---|---|---|
| | MSB | | | LSB | |
| 4Bh | G | R | G | G | Memory Test: The amount of memory above 8 MB has been found and verified. Checking for a soft reset and clearing the memory below 8 MB for the soft reset next. If this is a power-on situation, going to checkpoint 4Eh next. |
| 57h | Off | A | G | A | Chipset hook after memory size. |
| 53h | Off | R | A | A | Display processor cache size. |
| 54h | Off | A | Off | R | Disable parity and nmi reporting. |
| 60h | Off | R | R | Off | Test 8237 DMA Controller: The DMA page register test passed. Performing the DMA Controller 1 base register test next. |
| 65h | Off | A | R | G | Init 8237 DMA Controller: The DMA controller 2 base register test passed. Programming DMA controllers 1 and 2 next. |
| 7Fh | G | A | A | A | Extended NMI enable: Extended NMI source enabling is in progress. |
| 80h | R | Off | Off | Off | Enable Mouse and Keyboard: The keyboard test has started.<br>Clearing the output buffer and checking for stuck keys. Issuing the keyboard reset command next. |

| Post Code | Diagnostic LED Decoder | | | | Description |
|---|---|---|---|---|---|
| | G=Green,R=Red,A=Amber | | | | |
| | MSB | | | LSB | |
| 81h | R | Off | Off | G | Keyboard Interface Test: A keyboard reset error or stuck key was found. Issuing the keyboard controller interface test command next. |
| 82h | R | Off | G | Off | Check Stuck Key Enable Keyboard: The keyboard controller interface test completed. Writing the command byte and initializing the circular buffer next. |
| 83h | R | Off | G | G | Disable parity NMI: The command byte was written and global data initialization has completed. Checking for a locked key next. |
| 84h | R | G | Off | Off | Verify RAM Size: Checking for a memory size mismatch with CMOS RAM data next. |
| 84h | R | G | Off | Off | Check ATA Cable Type presence of ATAPI devices. |
| 84h | R | G | Off | Off | Display Keyboard Message. |
| 16h | Off | G | G | R | Display IDE mass storage devices. |
| 17h | Off | G | G | A | Display USB mass storage devices. |
| 85h | R | G | Off | G | Report the first set of POST Errors To Error Manager. |
| 86h | R | G | G | Off | Boot Password Check: The password was checked. Performing any required programming before Setup next. |

| Post Code | Diagnostic LED Decoder | | | | Description |
|---|---|---|---|---|---|
| | G=Green,R=Red,A=Amber | | | | |
| | MSB | | | LSB | |
| 8Dh | A | G | Off | G | OEM Patch 9. |
| 8Dh | A | G | Off | G | Set Printer RS-232 Timeout. |
| 8Dh | A | G | Off | G | Init FDD Devices: Resetting the hard disk controller next. |
| 95h | R | G | Off | A | Lock out PS/2 keyboard/mouse if unattended start is enabled. |
| 92h | R | Off | G | R | Option ROM Scan. |
| 98h | A | Off | Off | R | Init Boot Devices: The adapter ROM had control and has now returned control to BIOS POST. Performing any required processing after the option ROM returned control. |
| 9Bh | A | Off | G | A | Float Processor Initialize: Performing any required initialization before the coprocessor test next. |
| 9Eh | A | G | G | R | Enable Interrupts 0,1,2: Checking the extended keyboard, keyboard ID, and NUM Lock key next. Issuing the keyboard ID command next. |
| A2h | R | Off | A | Off | Report second set of POST errors To Error messager. |
| 86h | R | G | G | Off | Prepare And Run Setup: Error manager displays and logs POST errors. Waits for user input for certain errors. Execute setup. |
| 8Bh | A | Off | G | G | Set Base Expansion Memory Size. |

| Post Code | Diagnostic LED Decoder |  |  |  | Description |
|---|---|---|---|---|---|
|  | G=Green,R=Red,A=Amber |  |  |  |  |
|  | **MSB** |  |  | **LSB** |  |
| 8Ch | A | G | Off | Off | Adjust Setup: Programming the Setup options next. |
| A5h | R | G | R | G | Set Display Mode. |
| A7h | R | G | A | G | OEM Patch 12. |
| A7h | R | G | A | G | Build SMBIOS table and MP tables. |
| A7h | R | G | A | G | Program hotkey and timeout settings in keyboard controller. |
| A7h | R | G | A | G | Processor initialization before boot. |
| A7h | R | G | A | G | Copy required language strings to shadow RAM. |
| Aah | A | Off | A | Off | Copy required language strings to shadow RAM. |
| 000h | Off | Off | Off | Off | One Beep to indicate end of POST. No beep if silent boot is enabled. |
| 000h | Off | Off | Off | Off | POST completed. Passing control to INT 19h boot loader next. |

# POST Error Codes and Messages

The following table defines POST error codes and their associated messages. The BIOS prompts the user to press a key in case of serious errors. Some error messages are preceded by the word "Error" to highlight the fact that the system might be malfunctioning. All POST errors and warnings are logged in the System Event Log, unless the System Event Log is full.

Standard POST Error Messages and Codes:

| Error Code | Error Message | Pause on Boot |
|---|---|---|
| 100 | Timer Channel 2 Error | Yes |
| 101 | Master Interrupt Controller | Yes |
| 102 | Slave Interrupt Controller | Yes |
| 103 | CMOS Battery Failure | Yes |
| 104 | CMOS Options not Set | Yes |
| 105 | CMOS Checksum Failure | Yes |
| 106 | CMOS Display Error | Yes |
| 107 | Insert Key Pressed Yes | Yes |
| 108 | Keyboard Locked Message | Yes |
| 109 | Keyboard Stuck Key | Yes |
| 10A | Keyboard Interface Error | Yes |
| 10B | System Memory Size Error | Yes |
| 10E | External Cache Failure | Yes |
| 110 | Floppy Controller Error | Yes |
| 111 | Floppy A: Error | Yes |
| 112 | Floppy B: Error | Yes |
| 113 | Hard disk 0 Error | Yes |

| Error Code | Error Message | Pause on Boot |
|---|---|---|
| 114 | Hard disk 1 Error | Yes |
| 115 | Hard disk 2 Error | Yes |
| 116 | Hard disk 3 Error | Yes |
| 117 | CD-ROM disk 0 Error | Yes |
| 118 | CD-ROM disk 1 Error | Yes |
| 119 | CD-ROM disk 2 Error | Yes |
| 11A | CD-ROM disk 3 error | Yes |
| 11B | Date/Time not set | Yes |
| 11E | Cache memory bad | Yes |
| 120 | CMOS clear | Yes |
| 121 | Password clear | Yes |
| 140 | PCI Error | Yes |
| 141 | PCI Memory Allocation Error | Yes |
| 142 | PCI IO Allocation Error | Yes |
| 143 | PCI IRQ Allocation Error | Yes |
| 144 | Shadow of PCI ROM Failed | Yes |
| 145 | PCI ROM not found | Yes |
| 146 | Insufficient Memory to Shadow PCI ROM | Yes |

Extended POST Error Messages and Codes:

| Error Code | Error Message | Pause on Boot |
|---|---|---|
| 8100 | Processor 1 failed BIST | No |
| 8101 | Processor 2 failed BIST | No |

| Error Code | Error Message | Pause on Boot |
|---|---|---|
| 8110 | Processor 1 Internal error (IERR) | No |
| 8111 | Processor 2 Internal error (IERR) | No |
| 8120 | Processor 1 Thermal Trip error | No |
| 8121 | Processor 2 Thermal Trip error | No |
| 8130 | Processor 1 disabled | No |
| 8131 | Processor 2 disabled | No |
| 8140 | Processor 1 failed FRB-3 timer | No |
| 8141 | Processor 2 failed FRB-3 timer | No |
| 8150 | Processor 1 failed initialization on last boot. | No |
| 8151 | Processor 2 failed initialization on last boot. | No |
| 8160 | Processor 01: unable to apply BIOS update | Yes |
| 8161 | Processor 02: unable to apply BIOS update | Yes |
| 8170 | Processor P1 :L2 cache Failed | Yes |
| 8171 | Processor P2 :L2 cache Failed | Yes |
| 8180 | BIOS does not support current stepping for Processor P1 | Yes |
| 8181 | BIOS does not support current stepping for Processor P2 | Yes |
| 8190 | Watchdog Timer failed on last boot | No |
| 8191 | 4:1 Core to bus ratio: Processor Cache disabled | Yes |
| 8192 | L2 Cache size mismatch | Yes |

| Error Code | Error Message | Pause on Boot |
|---|---|---|
| 8193 | CPUID, Processor Stepping are different | Yes |
| 8194 | CPUID, Processor Family are different | Yes |
| 8195 | Front Side Bus Speed mismatch. System Halted | Yes, Halt |
| 8196 | Processor Model are different | Yes |
| 8197 | CPU Speed mismatch | Yes |
| 8300 | Baseboard Management Controller failed to function | Yes |
| 8301 | Front Panel Controller failed to Function | Yes |
| 8305 | Hotswap Controller failed to Function | Yes |
| 8420 | Intelligent System Monitoring Chassis Opened | Yes |
| 84F1 | Intelligent System Monitoring Forced Shutdown | Yes |
| 84F2 | Server Management Interface Failed | Yes |
| 84F3 | BMC in Update Mode | Yes |
| 84F4 | Sensor Data Record Empty | Yes |
| 84FF | System Event Log Full | Yes |

# BIOS Recovery Beep Codes

In the case of a Bootblock update, where video is not available for text messages to be displayed, speaker beeps are necessary to inform the user of any errors. The following table describes the type of error beep codes that may occur during the Bootblock update.

BIOS Recovery Beep Codes:

| Beeps | Error message | POST Progress Code | Description |
|---|---|---|---|
| 1 | Recovery started | | Start recovery process. |
| 2 | Recovery boot error | Flashing series of POST codes:<br>E9h<br>EEh<br>EBh<br>ECh<br>EFh | Unable to boot to floppy, ATAPI, or ATAPI CD-ROM. Recovery process will retry. |
| Series of long low-pitched single beeps | Recovery failed | EEh | Unable to process valid BIOS recovery images. BIOS already passed control to operating system and flash utility. |
| 2 long high-pitched beeps | Recovery complete | EFh | BIOS recovery succeeded, ready for power-down, reboot. |

# Bootblock Error Beep Codes

Bootblock Error Beep Codes:

| Beeps | Error message | Description |
|---|---|---|
| 1 | Refresh timer failure | The memory refresh circuitry on the motherboard is faulty. |
| 2 | Parity error | Parity can not be reset. |
| 3 | Base memory failure | Base memory test failure. **See "3-Beep-Boot Block Failure Error Code" table for additional error details. |
| 4 | System timer | System timer is not operational. |
| 5 | Processor failure | Processor failure detected. |
| 6 | Keyboard controller Gate A20 failure | The keyboard controller may be bad. The BIOS cannot switch to protected mode. |
| 7 | Processor exception interrupt error | The CPU generated an exception interrupt. |
| 8 | Display memory read/write error | The system video adapter is either missing or its memory is faulty. This is not a fatal error. |
| 9 | ROM checksum error | System BIOS ROM checksum error. |
| 10 | Shutdown register error | Shutdown CMOS register read/write error detected. |
| 11 | Invalid BIOS | General BIOS ROM error. |

# Appendix A: Equipment Log and Power Consumption Worksheets

# Equipment Log

Use the blank equipment log provided here to record information about your system. You will need some of this information when you run the SSU.

| Item | Manufacturer Name and Model Name | Serial Number | Date Installed |
|---|---|---|---|
| System | | | |
| Server Board | | | |
| Primary Processor Speed and Cache | | | |
| Secondary Processor Speed and Cache | | | |
| Video Display | | | |
| Keyboard | | | |
| Mouse | | | |
| Diskette Drive A | | | |
| Diskette Drive B | | | |
| Tape Drive | | | |
| CD-ROM Drive | | | |
| Hard Disk Drive 1 | | | |
| Hard Disk Drive 2 | | | |
| Hard Disk Drive 3 | | | |
| Hard Disk Drive 4 | | | |

| Item | Manufacturer Name and Model Name | Serial Number | Date Installed |
|---|---|---|---|
| Hard Disk Drive 5 | | | |
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# Current Usage

## Calculating Power Usage

The total combined power consumption for your configuration must be less than 500W, with any combination of loads not to exceed maximum current on any one channel as defined in Power Usage Worksheet 1. The combined power consumption on 5 V and 3.3 V should not be more then 150W. Use the two worksheets in this section to calculate the total used by your configuration. For current and voltage requirements of add-in boards and peripherals, see your vendor documents.

## Worksheet, Calculating DC Power Usage

1. List the current for each board and device in the appropriate voltage level column.
2. Add the current in each column, then go to the next worksheet.

# Power Usage Worksheet 1

| **Device** | **Current (maximum) at voltage level:** | | | | | |
|---|---|---|---|---|---|---|
| | **+3.3 V** | **3.3 V Standby** | **+5V** | **5 V Standby** | **+12 V** | **-12 V** |
| Server Board | 6.6 A | 0.0 A | 2.6 A | 1.5 A | .5 A | 0.0 A |
| Primary Processor | | | | | | |
| Secondary Processor | | | | | | |
| Memory (six DIMMs) | | | | | | |
| Full-Height PCI riser slot (see note 1) | | | | | | |
| PCI slot 1 | | | | | | |
| PCI slot 2 | | | | | | |
| PCI slot 3 | | | | | | |
| Low-Profile PCI riser slot (see note 1) | | | | | | |
| PCI slot 1 | | | | | | |
| PCI slot 2 | | | | | | |
| PCI slot 3 | | | | | | |
| Server Board Current SUBTOTALS | | | | | | |
| System Components (see note 2) | | | | | | |

| **Device** | **Current (maximum) at voltage level:** | | | | | |
|---|---|---|---|---|---|---|
| | **+3.3 V** | **3.3 V Standby** | **+5V** | **5 V Standby** | **+12 V** | **-12 V** |
| | | | | | | |
| **Total Current** | | | | | | |

**Note1**: Number of PCI cards depends on system and riser card configuration.

**Note2**: List additional system devices and associated currents.

## Worksheet, Total Combined Power Used by the System

1. From the previous worksheet, enter the total current for each column.
2. Multiply the voltage by the total current to get the total wattage for each voltage level.
3. Add the total wattage for each voltage level to arrive at a total combined power usage on the power supply.

# Power Usage Worksheet 2

| **Voltage level and total current (V X A = W)** | **Total Watts for each voltage level** |
|---|---|
| (+3.3 V) X (______ A) | ________ W |
| (+5 V) X (______ A) | ________ W |
| (-5 V) X (______ A) | ________ W |
| (+12 V) X (______ A) | ________ W |
| (–12 V) X (______ A) | ________ W |
| **Total Combined Wattage** | ________ **W** |

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